The RUBBER AGE

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LATE NEWS of the Industry

Auto Parts and Accessory Shipments Showed Decrease in July From June

SHIPMENTS of service parts to wholesalers during July showed a two-point increase over June, according to reports received from member automotive manufacturers by the Motor and Equipment Association, which includes several rubber companies in its membership. The July index figure stood at 124 per cent of the base (January, 1925) to compare with 122 for the preceding month.

There were declines, however, in shipments of original equipment to vehicle manufacturers, accessories to wholesalers, and service equipment to wholesalers so that the grand index of all shipments showed a decline from June.

This grand index for all groups of manufacturers reporting to the M. E. A. for July stood at 85 per cent of the January, 1925, base figure of 100 as compared with 98 for June and 88 for July, 1930. Several plants reported that they were closed during July for the usual summer vacation or inventory period.

Kelly-Springfield Tire Company Shows Net Loss of $281,436 in First Half

OPERATIONS of the Kelly-Springfield Tire Company for the six months' period ended June 30, 1931, as outlined in a statement by W. H. Lalley, president, showed a profit of $116,855 after all charges but before deduction for depreciation. After deducting depreciation of $398,291, a net loss of $281,436 resulted, comparing with a net loss of $587,610 in the first half of 1930.

Current assets were $10,633,182 before deducting reserve for raw material commitments as compared with $9,315,529 at December 31; current assets after deduction for commitment reserve were $10,098,717 as compared with $8,555,529; current liabilities at June 30 were $2,230,617 as compared with $701,709 at December 31; net working capital after deduction of reserve for raw material commitments was $7,868,100 as compared with $7,853,820 at December 31, 1930, including customers' deferred balances at both periods.

No adjustment to raw materials was necessary at June 30. Reserve for commitments set up at December 31, 1930 was deemed sufficient to reduce to market raw materials on hand as well as commitments for 1931, purchases having been made during the year at favorable prices. Raw material contents of finished goods and goods in process were valued at cost.

Unit sales to dealers for six months in 1931 showed a substantial increase over a like period in 1930.

"Operations of the company are showing a progressive improvement," Mr. Lalley stated. "Under the new management effective late in March of this year, operating expenses both in manufacture and distribution have been reduced, and further economies are contemplated.

"The company continues in excellent financial position free of long term notes and bonded indebtedness, and with bank loans at the present time amounting to only $500,000 as compared with $1,500,000 at same time last year."

Scanning the Headlines

Crude rubber sells down to 4.80 cents a pound, and growers consider following Brazilian coffee interests in crop destruction . . . . GOODYEAR *makes plans for keeping its workers busy during the winter . . . . Rubber chemists assemble at Buffalo, discuss papers, banquet, and elect E. R. Bridgwater chairman . . . .* KELLY-SPRINGFIELD *records net loss and Raybestos-Manhattan lowered profits . . . . Tire factory output turns downward . . . .* CANADIAN GOODRICH *passes interest . . . . Mechanical goods testing methods reflect technical progress of the industry . . . .* U. S. RUBBER RECLAIMING *completes year without factory accident . . . . Safety men plan to attend Rubber Division, N. S. C., sessions at Chicago next month . . . .* BOSTON WOVEN HOSE *reduces common dividends . . . . Passing of C. Harold Smith ends romantic career and removes leading figure of carbon black industry . . . .* GENERAL *to make Lambert Trublpruf cushion tire . . . . Company securities slump with rest of market.*

PROGRAM OF THE RUBBER SECTION, NATIONAL SAFETY COUNCIL

Tuesday Afternoon, October 13

2:00—Report of year's activities by the General Chairman, C. L. Hungerford (Firestone Tire & Rubber Company).

2:15—Report of the Engineering Committee by the Chairman, M. H. Kilgore (Goodyear Tire & Rubber Company).

2:25—Report of the Statistics Committee by the Chairman, H. W. Low (B. F. Goodrich Company).

2:35—R. R. Gross (Firestone Tire & Rubber Company) *Where Safety Stands in Our Organization.*

3:05—Discussion.

3:25—Charles Greenfield (Du Pont Viscoloid Company). *Industrial Fire Protection.*

3:55—Discussion.

4:20—Report of Nominating Committee and Election of Officers.

Wednesday Afternoon, October 14

2:00—P. W. Gumaer (Barrett Company). *Ventilation for Solvents in the Rubber Industry.*

2:30—Discussion.

3:00—Dr. J. Newton Shirley (Hood Rubber Company). Address.

3:30—Discussion.

4:00—R. S. Colley (B. F. Goodrich Company). *Making Winter Aviation Safe* (Motion Picture).

Thursday Afternoon, October 15

2:00—H. A. Walker (Goodyear Tire & Rubber Company). *Safety Kinks in the Rubber Industry.*

3:00—General Round Table Discussion:

1. J. T. Kidney (Goodyear Tire & Rubber Company). *How Can We Interest the New Employe in Safety Work?*
2. M. A. Quirk (United States Rubber Company). *Organizing and Maintaining Interest in the Safety Committee.*
3. P. B. Martens (Ohio Industrial Commission). *Safeguarding Health of Compounding Room Employes.*
4. W. L. Schneider (B. F. Goodrich Company). *Inspection of Rubber Machinery and Equipment.*
5. E. W. Beck (United States Rubber Company). *Basic Causes of Accidents and Their Value.*

All sessions at Stevens Hotel, Chicago, Ill.

Rubber Section Plans Important Program For Annual Safety Congress at Chicago

SAFETY engineers of the rubber industry will convene at the Stevens Hotel, Chicago, Ill., next month, together with safety men in other industrial lines, for the 20th annual Safety Congress and Exposition. These sessions, which are held under the auspices of the National Safety Council, will extend from October 12 to 16 and will be featured by sectional meetings, round table discussions, motion picture entertainment, an elaborate exhibit of safety devices, a "smile party" and a banquet.

The Rubber Section sessions will extend from October 13 to 15 and will include six prepared papers, discussions, five short round table talks, reports by the statistical and engineering committees, and the nomination and election of officers, as shown in the above program. These meetings will be held in the Stevens Hotel and will be under the supervision of C. L. Hungerford, of the Firestone Tire & Rubber Company, as general chairman.

The display of mechanical safety appliances and other exhibits will contain many features of interest to rubber men. An educational exhibit by the United States Navy will show life-saving appliances and a model of the new type hangar built by the Goodyear-Zeppelin Corporation to house the construction of the U. S. S. Akron. Manufacturers' exhibits will include goggles, helmets, masks, special protective clothing, safety devices for handling hazardous liquids, latest improvements in drums, valves and carboys, special fire extinguishing equipment for chemical hazards and other apparatus.

Goodyear Tire & Rubber Company Plans To Stabilize Employment During Winter

PRODUCTION executives of the Goodyear Tire & Rubber Company are studying plans to stabilize employment through the winter by holding the total number of factory employes at the present level. The seasonal falling off in tire consumption will be met by adjustments in the length of hours per week worked by employes.

While no commitment has been made that there would be no layoffs, President P. W. Litchfield in a statement characterized the plan as "an attempt to peg unemployment at its present levels." The plan, Mr. Litchfield felt, would, if worked out, accomplish two things: it would give present employes assurance of work throughout the winter; it would tend to prevent unemployed of other towns from coming into Akron to find work and so add to relief problems there.

For the last two years the Goodyear company has been trying to reduce layoffs by resorting to the six-hour day, running four shifts, and the "stagger system" under which an employe would take one week off in seven or even more frequently to make what work there was go as far as possible.

This will be an attempt, however, to prevent layoffs entirely, and is in line with President Hoover's recent recommendations to industry toward employment stabilization. The six hour-four shift day gives a maximum reflexibility from a production standpoint, Mr. Litchfield stated.

Despite the almost universal use of automobiles throughout the twelve months, the seasonal element is still a definite factor in the tire business. Only about half as many tires being bought in the winter months as in the summer. The four months, June-September, are responsible for 42 per cent of the car owners purchases of tires, while November and December total about 12 per cent.

The tire manufacturers have sought to even off these peaks and valleys of demand by the "spring dating system" under which tire dealers buy as high as one third of the year's requirement in December and January for delivery after January 1, with payment spread over 90 days instead of the usual 30-day periods. These spring dating orders give the manufacturer a backlog to hold his production organization together after the first of the year but leave him still with a personnel problem for the last months of the year.

"It seems to be quite possible however," President Litchfield states, "to so divide up the work to carry the production organization throughout the whole period and have the men available when the turn comes in January and be in better shape to meet the heavier demands of summer.

"I am inclined to believe that the principle of spreading out the work as far as it will go is applicable to a considerable extent to many industries, merchandising houses, with such adaptations as the requirements of the particular business require.

"While the final solution of unemployment waits on the fundamental adjustment of business, I believe that distress

in the meantime can be mitigated by a sincere effort on the part of employers to keep at least the majority of their employes in an earning position rather than to keep part of them on full time and the rest of them without any work at all."

Raybestos-Manhattan, Inc., Made Profit Of $580,179 During First Half of 1931

RAYBESTOS-MANHATTAN, Inc., has reported for the six months ended June 30, 1931, a consolidated net income after all charges, depreciation and federal taxes, of $580,179, equivalent to 86 cents a share on 676,102 shares of no-par common stock. This compares with earnings of $825,499, or $1.22 a share on 675,007 shares, in the first half of 1930 and with $2,098,530, or $3.10 a common share in the first half of 1929.

The consolidated net income for the quarter ended June 30 amounted to $338,976, after taxes and charges, equal to 50 cents a share, and comparing with $241,203, or 35 cents a share in the preceding quarter, and $374,524, or 55 cents a share, in the June quarter of last year. All of the company's divisions operated at a profit during the half-year.

The company's balance sheet at the end of June showed current assets of $8,266,178, including $3,126,606 of cash and cash funds. The current liabilities were $553,314, and the ratio between current assets and current liabilities was 15 to 1. There were no bank loans or funded debt. Of the current liabilities, $91,000 represented reserve for federal taxes and $90,000 represented accrued wages and salaries.

Consistent improvement has been shown in earnings for each quarter of this year and despite the disbursement of $864,344 in dividends, the net working capital remains approximately the same as at the beginning of the year. Substantial economies have been effected and the divisional budgets indicate that further ones in prospect will be accomplished with good results.

Not only has the company's business maintained a consistent upward trend during the current year, but business in August has run at a rate in advance of July, which in turn exceeded June. Similarly, earnings of $580,179, or 86 cents a share, in the first half of the year compare with net profits of $331,271, or 49 cents a share, in the last half of 1930.

The directors declared a dividend of 40 cents a share, payable September 15 to stockholders of record as of August 31, as against previous quarterly dividend payments of 65 cents a share. This places the stock on a $1.60 annual basis, as compared with $2.60 previously.

The income account of Raybestos-Manhattan, Inc., and its constituent subsidiaries compares as follows for the six months ended June 30:

	1931	1930	1929	1928
Net Sales	$7,262,153	$9,571,451	$12,785,382	$11,120,710
...et before dep.eciation*	865,015	1,098,854	2,411,249	1,589,511
Depreciation	284,836	273,355	312,719	287,150
Net income	$580,179	$825,499	$2,098,530	$1,302,761

*After federal taxes, adjustment of inventories, etc.

B. F. Goodrich Company Assets Lower; Canadian Unit Omits Bond Interest

THE consolidated statement of the B. F. Goodrich Company as of June 30, 1931, shows total assets of $150,918,258 comparing with $185,622,589 on June 30, 1930, and surplus of $7,536,421 as against $19,188,628. Current assets were $78,558,557 and current liabilities $9,074,384 comparing with $106,187,160 and $21,964,853, respectively, on June 30, 1930.

The company's actual deficit after dividends for the first half of 1931 amounted to $1,371,313 as compared to a similar deficit of $4,638,096 in the first six months of 1930. In the same period of 1929 there was a surplus of $2,204,980 and in 1928 a deficit of $4,240,723.

The Eastern Trust Company, Toronto, Canada, is advising holders of 7 per cent income bonds of the Canadian Goodrich Company, Ltd., subsidiary of the B. F. Goodrich Company, that no action has been taken relative to payment of interest due September 1. It is stated that operations for the first half of 1931 did not show a profit.

The consolidated income account of the B. F. Goodrich Company for the six months ended June 30, 1931, compares with the like periods of the three previous years as follows:

	1931	1930	1929	1928
Net sales	$59,878,341	$78,007,291	$75,375,871	$70,624,878
Expenses, etc.	56,218,013	74,870,803	67,742,297	69,741,298
Balance	$3,660,328	$3,136,488	$7,633,574	$883,580
Other income	855,820	628,902	1,241,011	405,406
Total income	$4,516,148	$3,765,390	$8,874,585	$1,288,986
Depreciation	2,800,126	2,932,688	1,803,742	1,558,341
Interest	1,999,464	2,086,572	1,328,704	1,305,534
Estimated federal tax	.....	.....	633,000	.....
Minimum interest	5,041	39,036	38,621	.....
Net loss	$288,483	$1,292,906	*$5,070,518	$1,574,88*
Preferred dividends	1,082,830	1,124,410	1,165,990	1,207,570
Common dividends	.....	2,220,780	1,699,548	1,458,264
Deficit	$1,371,313	$4,638,096	†$2,204,980	$4,240,723

*Net income. †Surplus.

Tire Factory Production Schedules Turn Lower After Middle of August

AFTER maintaining a steady rate of output slightly higher than for the same period in 1930, domestic tire manufacturers dropped their production schedules toward the end of last month. It is probable, however, that September casing production will be higher than the low figure recorded for that month last year.

Authorities in the trade estimate tire production for the week ended August 18 for some of the leading companies to have been approximately as follows:

Goodyear	260,000
Goodrich	110,000
Firestone	100,000
Seiberling	28,000
General	24,000
United States (5 days)	25,000
Pharis	22,400
Mansfield	21,000
India	13,500
Mohawk	5,000

These rates of output, with one or two exceptions, represent moderate declines from the high production months of May and June, and it is believed that September schedules are still lower.

Notice to Canadian Subscribers

PURSUANT to the conditions imposed by the Canadian Tariff on Publications, as passed by the House of Commons on July 28, 1931, the Canadian subscription rate to THE RUBBER AGE, effective September 1, 1931, is increased $1.20 yearly (5 cents per issue). The new rate will therefore be $3.70 yearly. This increased rate will only affect present subscriptions which expire after April 1, 1932, in which case that portion of such subscriptions which extend beyond that date will be billed at a higher rate on a pro-rata basis. All subscriptions expiring from this date on will only be renewed at the new rate.

***Publishers*, THE RUBBER AGE.**

New York, September 1, 1931.

(Other news of the industry will be found on Pages 513-519)

LATE DEVELOPMENTS *in Tests*

The Trend in Recent Practice is Toward Laboratory Conditions—Field Trials in Actual Service Have Proved

By ARTHUR W. CARPENTER *Manager of*

THE trend of development in recent practice for testing mechanical rubber goods is decidedly toward increased use of laboratory tests of the performance type. Such tests consist of subjecting an article in the laboratory to some or all of the conditions actually encountered in service until either measurable deterioration or definite failure results. In order to expedite the completion of the tests, some of the factors such as temperature, load, speed, or extent or distortion of the article, may be exaggerated. Performance tests, then, are realiy laboratory imitations of the actual service carried out under controlled conditions which are usually so chosen as to accelerate the service effects.

Use of Old Type Tests

For many years manufacturers depended in the development and application of their products on quality evaluation which consisted of the judgment of the men supervising manufacture, of field trial in actual service and of laboratory tests to determine certain specific properties such as tensile strength, ultimate elongation, hardness, adhesion and permanent set. Many of the older rubber men developed rare judgement through experience. Guided by simple hand tests of stretching, tearing, cutting, firmness, and by appearance and resistance to biting, these men often obtained remarkable results. Unfortunately, they also were sometimes misled and no actual recorded data were ever available to support their opinions. Field trial in actual service was usually very slow. Samples were frequently lost and reliable reports were difficult to obtain. Sometimes the effect on relations with the consumer was unsatisfactory. Consequently, more reliance came to be placed on laboratory tests of physical properties. These have been more or less standardized and can be duplicated within limits by both manufacturer and consumer. They are carried out rapidly under controlled conditions and loss of test specimens is avoided. In consequence of the fairly satisfactory results particularly as regards uniformity of product which have followed use of such tests, they have been incorporated along with material requirements in most of the present purchase specifications for mechanical rubber goods.

Fig. 1. Flexing Endurance Test of Fan Belts.

Defects of Old Type Tests

In considering evaluation of product by the older tests of physical properties, several shortcomings are at once apparent. In the first place, the measure taken for quality is either the magnitude of a force applied to the test specimen or the extent of the deformation produced by a known force. In actual service the performance of the article depends on the time the forces are acting, on the temperatures attained through energy transformation and on fatigue effects which may possibly involve changes in the structure of the material as well as on both the magnitude of the forces and the deformation produced. Actual performance is very much more complicated than the simple physical tests indicate and involves combinations of elements which are often very difficult or even impossible to analyze and determine. It can be hardly assumed that tensile strength, elongation, friction pull and such tests will give any precise indication as to service performance.

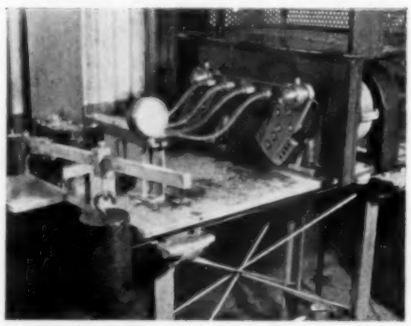

Fig. 2. Flexing Endurance Test of Hydraulic Brake Hose with Internal Pressure Applied.

For example, a high grade vulcanized rubber compound may show a tensile strength of 4,000 lbs. per sq. in. and an ultimate elongation of 500 per cent when tested in the usual way. However, if similar specimens of the same compound are stretched repeatedly at the rate of 300 extensions per minute to elongations of only 200 per cent under loads which never exceed 1,000 lbs. per sq. in., the strips may break after some 8,000 extensions without ever

on MECHANICAL RUBBER GOODS

Tests of the Performance Type, Carried Out Under Controlled Too Slow — Flexing Endurance Testing is Most Important

Laboratories, The B. F. Goodrich Company

having been subjected to the ultimate tensile load or elongation. Other compounds with substantially the same initial properties can be made which will withstand many more extensions. Much of the progress in the rubber industry has been based on the older tests and their value in compound comparisons and in uniformity control should not be depreciated but it is desirable to point out that too much significance as to actual service should not be attached to them.

Another defect in the older tests is due to the fact that they usually involve separating and testing the component parts of an article. In service, the article behaves as a fabricated structure. The forces acting on it and within it have both magnitude and direction. When the structure is broken down, the conditions are entirely altered. Obviously, the separate determinations can give but little information concerning the performance of the structure as a whole. Then, too, in some cases the shape or size of the article is such that the ordinary tests cannot readily be applied to the finished product and satisfactory test specimens are difficult or impossible to prepare. Under all of these circumstances, it is not surprising that tests which more nearly approach service conditions have been developed.

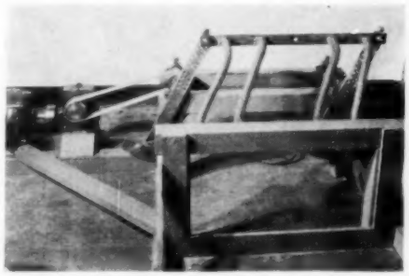

Fig. 3. Vacuum Cleaner Hose Flexed in Temporary Equipment.

Performance Tests

No hard and fast rule can be given as to what constitutes a performance test. Some would consider that tests such as the familiar ones for accelerated aging, for bursting strength of hose, and for stress-strain relations on fabricated articles in both tension and compression are really performance tests. There are sound reasons for this opinion. However, consideration will here be restricted mainly to tests in which effort has been made to imitate the actual service. With this kind of tests, the possibilities are almost innumerable for there can be as many different forms of tests as there are kinds of articles or services and often substantially the same test can be carried out in several different ways. It is necessary therefore to restrict further and to mention only a few examples of certain general types of satisfactory performance tests.

Many of the most useful performance tests for mechanical rubber goods may be classified as flexing endurance tests. These involve repeated bending of the specimen until failure occurs. Such tests have many modifications. The bending may be free or definitely limited as over a pulley. The specimen may be under substantial load or not as desired. In cases such as hose, internal pressure and temperature may be applied. The failure is usually either by separation of the component parts, by rupture of the whole or a portion, or by appearance of cracking which might ultimately lead to rupture.

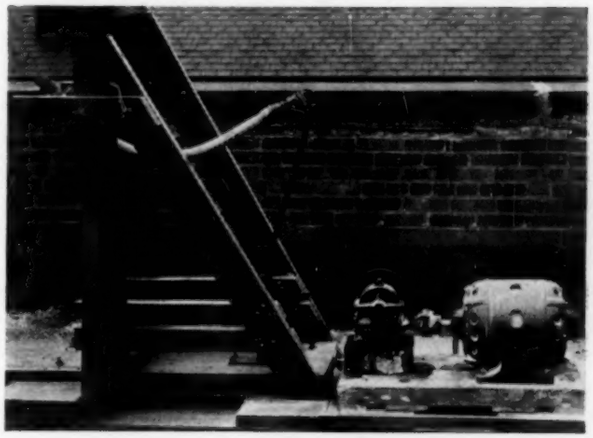

Fig. 4. Another Flexing Motion Applied to Gasoline Hose.

Flexing Endurance Tests

BELTING—A familiar example of flexing endurance with failure by separation is that of 4-ply samples of belting one inch in width tested under tension load over the small pulleys of the Scott flexing machine. This method has been fully discussed by Gibbons,[1] Sturtevant,[2] and Depew and Jones.[3]

Figure 1 shows an application to V-type automobile fan belts where failure is usually by breaking. In this case the belt under test is flexed by being driven over sheaves similar to those used in service. If smaller sheaves are used, the test is greatly accelerated due to the increased angle of flexure. The upper sheave is motor driven at a speed of 3250 R.P.M. Suspended from the lower sheave with suitable guides is a dead weight load which accelerates the test depending on its amount. Both 50 and 75 lbs. have been used as standard weights. The belt transmits only sufficient power to flex it around the sheaves and overcome any friction and windage losses. In testing an ordinary popular size of standard fan belting using 75 lbs. weight, failure will usually occur within a few hundred hours of continuous running. By comparison with proving ground field trials, a rough correlation factor between hours of test and miles of car service can be obtained. This test has been widely used and seems to be quite satisfactory as a control of uniformity of any one particular construction of belt.

In studying many different belt constructions, difficulty has been encountered with the dead-weight test in attempting to compare the probable service for different types of

belts. Cases have been found where one belt showed superior life in the test to another but was inferior in actual service. In this connection, it should be recalled that the test is highly accelerated by excessive tension. In service, the failure is due to a variety or combination of other causes and it should hardly be expected that emphasizing one factor only would give comparable results with different kinds of belts. In trying to overcome this difficulty, the most recent development has been to include transmitted power load as well as dead-weight tension. Under these conditions, it is possible even to require sufficient power that slippage of the belt on the sheaves is induced. The power load has been obtained in various ways. One very satisfactory method is to use a motor-generator dynamometer

Fig. 5. Flexing Test of Rubber Soling.

set. If desired this equipment can be so arranged as to measure the actual power delivered to the belt by the motor sheave excluding the motor losses and the power delivered by the belt to the generator sheave. The difference then is the energy used by the belt itself. Another method of applying power load which is in successful use by the General Motors Research Laboratory is to place a small water brake on the shaft of the driven sheave. Under these conditions, the test more nearly approaches the actual service and can still be accelerated, but without excessive emphasis on one factor alone.

The same types of flexing endurance life tests mentioned for fan belts are applied to the larger power transmission belts of both V-type and flat construction. The equipment must of course be built of suitable size and capacity and the pulleys must be adapted to the belt under test. With long belts, it is usually necessary to run them horizontally and the tension load may then be applied through a system of levers or pulleys.

Hose—Flexing endurance tests have been found very valuable in laboratory comparisons of various kinds of hose. Here again the details of the applications vary, depending on the service, but the principle of the method remains substantially constant. Figure 2 shows equipment designed by the Wagner Electric Company for testing hydraulic brake hose. The fixed ends of the hose samples are connected to a manifold through which the hose is filled with hydraulic brake fluid and kept under constant pressure of 200 lbs. per sq. in. by means of a plunger attachment actuated by a weight on the end of a lever. The other ends of the hose are rotated without twisting through a circle 8 in. in diameter at the rate of 790 R.P.M. The measure of endurance is the number of revolutions before bursting or the time during which the hose maintains the internal pressure. The test is accelerated over normal service by increased speed and angle of flexure and by high internal pressure. Essentially this same test with modifications has been used by the Pennsylvania Railroad and others for steam hose. In this case, internal steam pressure of 150 lbs. per sq. in. is employed and so the factor of temperature is introduced. Hose specimens 24" in length are mounted vertically to provide for draining off the condensate through pet-cocks and the circle of rotation of the movable end is 4" in diameter. The speed is reduced to 25 R.P.M. Figure 3 shows how such test equipment can be cheaply constructed for temporary use from materials readily available. In this case, the samples are household vacuum cleaner hose and are being tested in flexure only without internal pressure or temperature. Another way of flexing hose is shown in Figure 4. Here gasoline hose filled with the liquid is being flexed.

Soling—Figure 5 shows a simple flexing test used for rubber soling. The samples are held firmly at each end in clamps having rounded edges. The upper clamp is fixed and the lower is driven with a reciprocating motion of two inches stroke. The weight of the lower clamp and connecting rod is supported by the samples and amounts to 1.125 lbs. per sample. The speed is 340 flexures per minute. Care is necessary that the distance between the upper and lower clamps is always set precisely the same. The results are expressed as the total number of flexures to cause cracking. Another excellent flexing test for soling consists in running a belt to which standard specimens of the soles have been stitched, over pulleys under standard conditions. In this case great care must be taken to have the stitching uniform.

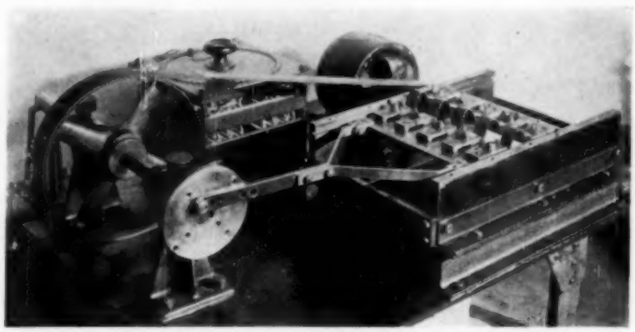

Fig. 6. Machine for Flex-Cracking and Fatigue Stretching.

Other Fatigue Tests

Although the flexing tests described are really special forms of fatigue tests, they have dealt mainly with fabricated rubber products. There remains a very valuable group which consists of dynamic fatigue tests applicable particularly to vulcanized rubber compounds. In this class are tests for flex-cracking and fatigue stretching and tests of the effect of repeated compression and compression flexing. Figure 6 shows a machine which has been used for some years in studying flex-cracking and fatigue stretching. Similar machines have been described by Cooper[4] and by Somerville.[5] The rubber test specimens which may be either dumbbells or one inch wide strips are clamped in the jaws of the machine, one of which is stationary while the other is driven as a cross-head with a reciprocating motion. If the samples are placed in the clamps just without tension when the jaws are farthest apart, the action will be that of free bending as illustrated. If however the clamping is done when the jaws are nearest together, then the action will be to stretch the samples. The distance between the jaws and the length of the stroke are adjustable to provide for a wide range in jaw separation. Use of a D. C. motor and a rheostat permits operation at various speeds. With this machine, the fatigue effect in rubber compounds, at low extensions as compared with the ultimate elongation, is readily shown, although correlation with actual service is not always so easy. For comparative testing however, the results are often more satisfactory as referred to the service than comparison of the ultimate tensiles and elongations of the stocks. The initial failure in either free bending or

repeated stretching is usually evidenced by appearance of small cracks and if the action is continued the specimens finally break. Somerville[5] has published an admirable study of fatigue stretching in which he shows that life of the sample decreases very rapidly as the extension is increased, while, within the range of his investigation, variations in speed of stretching and degree of cure of the compounds were without effect when testing was done at normal temperatures.

Fatigue tests using repeated compression and compression flexing are especially suited for rubber compounds which are used to absorb vibration. Depew and Snyder[6] have described a pounding test in which cylinders of rubber 5 in. in diameter and 3¾ in. high are subjected to a compressive load three times per second. The sample was supported on an air chamber so designed that the maximum compression at each stroke occurred at 2,500 lbs. load. In this test, the percentage deflection may vary but the maximum load of each stroke is constant. Many instances are found in service where these conditions obtain. If the support of the test sample is made rigid, the repeated compression may then be carried out under conditions of constant deflection and the load will vary as the properties of the stock change due to fatigue and permanent set. By suitable placement of the sample relative to the compressing mechanism and proper selection of the length of stroke, the sample may be hammered with impact or simply compressed, as desired. The failure of the samples appears to be due to the temperature produced in the interior and is ultimately shown by softening and porosity of the rubber in the center of the sample or even by melting and final blow-out. Compounds which develop low maximum interior temperatures during the test give superior results in service.

An excellent test in which small samples held under compression can be subjected to fatigue flexure has been described by Abbott.[7] In this method the specimen is held under compression between two horizontal plates by means of hinged bolts. The lower plate is fixed and the upper one is given a horizontal reciprocating motion by means of an attached driving mechanism. The compression may be either to constant deflection or under constant load and proportioned to the specimen. The extent of the flexures is also adjustable. The spread of flexure is taken as 800 cycles per minute. Permanent set after a definite number of flexures is used as the measure of results for comparison although ultimate failure would again be physical break down and blow-out of the stock.

Wear Tests

Much has been written concerning the various laboratory abrasion tests and their relation or lack of it to actual service. The complex nature of service wear renders proper analysis of all the factors nearly impossible. Possibly what is needed most is agreement on an exact definition for abrasive wear since without such a precise basis, development of satisfactory tests seems improbable. Sometimes, however, it is necessary to get some information concerning the wearing properties of rubber goods which cannot be secured through any of the usual abrasion tests. A recent instance involved rubber discs for steam valves. Figure 7 shows the equipment designed for this test. The valve disc under test is mounted on the stem of the valve in the usual way and the valve is connected with a 150 lb. steam line. The valve is opened by the mechanism shown and closes under the acting of a falling weight. By the use of a check device, excessive impact is avoided. By these means, the forces acting on the disc in the repeated cycles are kept uniform. The test is accelerated by the rate of operation of 43 cycles per minute and the torque at

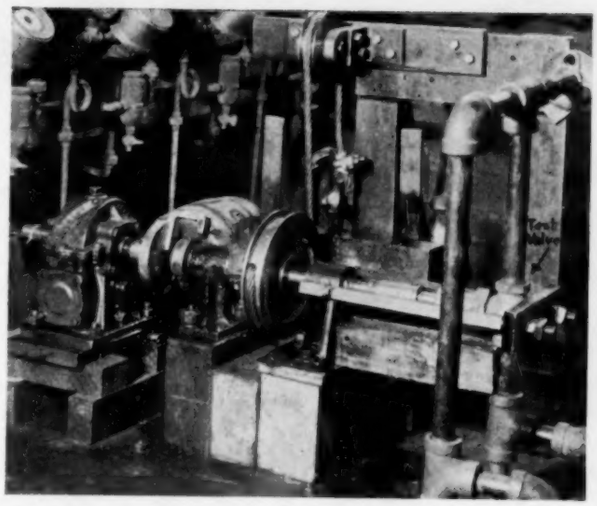

Fig. 7. Service Test for Steam Valve Discs.

closing of 12 ft. lbs. This test is a direct imitation of the actual service. The same equipment can also be modified to imitate the service given an automobile running board mat when one's shoe is twisted on it. In this case, the mat mounted on a solid backing replaces the brass valve and its seat and in place of the valve disc a circular metal plate which may even carry an abrasive is twisted against the mat under controlled load conditions.

In conclusion, it is desired to emphasize the care which must be taken in analyzing service conditions before designing performance tests. It is absolutely essential to select the proper factors involved in the service and to combine them in proper proportion. This kind of tests includes those usually suggested first for any new article or in case of trouble because everyone has ideas concerning the service and how to imitate it. Intelligent design of the test so that it can be controlled, duplicated and interpreted is quite a different matter.

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[6]H. A. Depew and E. G. Snyder—*Proc. A. S. T. M.* Vol. 29 Pt. 2 P. 962 1929.
[7]F. D. Abbott—*Ind. Eng. Chem.* Vol. 20 No. 8 P. 853 1928.

Rubber Printing Ink

IT is usually desirable to mix the colors for printing inks into the cement without milling them into the rubber. To establish this, and produce an ink free of color chunks, it is best to mix the color with about three times its bulk of the solvents used for the ink, i.e., naphtha, benzol, carbon tetrachloride, turpentine, or kerosene, or a mixture of these. This solvent pigment mixture is allowed to stand for about an hour with occasional stirring. Then the rubber cement which is used for a binder is poured into this solvent pigment mixture with continuous stirring. The above procedure applies to any cement where it is desired to incorporate pigments without milling them into the rubber. (R. R. Olin Laboratories, Akron, Ohio)

Application of Banbury Mixer Equipment on Shoe Stocks, Water Proofing and Mechanical Rubber

A LARGE eastern rubber company has been using a No. 9 Banbury Mixer with a 72″ sheeting mill for the past four years in the manufacture of shoe stocks, clothing, waterproofing, and mechanical goods. This equipment does the work of eight 45″ mills formerly used, and does it better at a lower cost.

This report will describe the operation of the equipment and show how a cost reduction of 59.1 per cent is being effected.

Selection of Equipment

Up to the time the Banbury was installed, the 45″ mills were used to mix and sheet the rubber. This practice required considerable skill on the part of the operator since both quality and quantity of output were entirely dependent on the man himself.

When the plant outgrew the capacity of its 45″ mills, it was decided to try a Banbury mixer with a 72″ sheeting mill. With the installation of this equipment, the production increased considerably, with a corresponding decrease in costs. The amount of space taken by the Banbury was found to be 33.9 per cent less per unit of output than that for the 45″ mills. This was a distinct advantage as the plant did not have much room for expansion.

Other advantages soon became apparent. Responsibility for quality of the product was transferred almost completely from men to machines, eliminating the human element. The uniformity of mix was much improved. Tensile strength was increased at least 10 per cent. These advantages and others to be discussed later have so satisfied the management that an additional Banbury mixer will be purchased when the plant expands further.

Description of Banbury Mixer

The Banbury mixer consists essentially of an enclosed water-cooled chamber in which two water-cooled mixing rotors of special design are revolved. The material to be mixed is fed into the chamber through a hopper at the top of the machine. An air-operated floating weight closes the entrance to the chamber and automatically keeps the material in the region of effective mixing action. The mixed product is discharged through an air-operated sliding door at the bottom of the chamber onto a conveyor belt which carries the material to the adjacent 72″ sheeting mill.

A timing dial and recording thermometer are also provided to give the operator absolute control over the batch during various stages of the mixing cycle.

Mixing Operation

The specific amounts of crude and reclaim rubber for each batch are weighed off and placed in conveyor boxes. Other boxes, containing weighed amounts of coloring matter and compounds, are also prepared. The boxes are then set in groups on a special conveyor over which they move to the Banbury hopper.

The Banbury operator receives standard instructions with each batch, and marks off the various stages of the mixing cycle on the dial of the timing clock. He then dumps the rubber into the hopper and permits the mixer to operate for the period designated in the instructions. At the proper time, the compounds and coloring matter are added. Further control over the batch is obtained by watching the recording thermometer, which must read within predetermined limits for each part of the cycle.

Maintenance and Repairs

The Banbury mixer has cost practically nothing for repairs since it was installed four years ago. Aside from some new packing, the machine has required no repair attention at all. This is in marked contrast with the plant's recorded average of $90.00 spent for repairs each year on each of the 45″ mills.

The management has taken good care to see that the Banbury is properly maintained. A service man goes over the machine every day and sees that all parts are in good shape and well oiled. This inspection and oiling takes fully an hour and a half every day, but the expense involved is believed to be warranted by the savings in repairs and avoidance of down-time losses. The 45″ mills formerly used got about the same routine attention each day, but the cost of lubricants was somewhat higher.

Savings Effected and Other Advantages

The savings effected through the use of the Banbury amount to $.2841 per 100 lb. (59.1 per cent) or, on a basis of a 277-day year, with 42,000 pounds produced daily, to $33,051.64 annually. This is equivalent to a return of 132 per cent per year on the investment.

In addition to the above saving, which is really smaller than actual due to the fact that it does not include the saving in overhead, there are the following important advantages:

1. The quality of the product has been improved through the more thorough mixing of the batch. Tests have shown the mix to be much more uniform when made with the Banbury, and the tensile strength of Banbury-mixed stocks is at least 10 per cent greater than that of stocks mixed on the 45″ mills.

2. Control over production and quality is absolute. There is no need to rely on the judgment of the operator.

3. Larger batches are handled, which tends to keep the resultant product more uniform, due to

   (a) Decreased percentage in error of weighing the ingredients for one large batch versus three or four small batches.

   (b) Giving in one large batch a more representative sample or average of the quality of each of the various ingredients as compared to the variations possible in several smaller batches.

4. The job of mixing is now much safer and cleaner. Excess carbon black is not scattered around onto other machines and materials. The air is kept clear of dust by an exhaust system which fits over the feed hopper. The danger of a man's hand being caught in the rolls of a mixer is also entirely eliminated, as there is no need of coming near the Banbury rotors.

5. Valuable floor space is saved. The Banbury with its 72″ sheeting mill requires 30 per cent less space than the eight 45″ mills. Comparison of floor space requirements per unit of output shows a true saving of 33.9 per cent.

6. Power requirements are reduced 39.5 per cent.

7. Labor costs are reduced 77.6 per cent, not including the saving in insurance and overhead charges obtained by eliminating eight men.

EDITOR'S NOTE: The above survey was made by A. C. Nielsen Company, in collaboration with a large Eastern rubber company. It is regretted that space does not permit the inclusion of several tables showing costs and general operating data. These can doubtless be secured from the Nielsen Company, upon request.

RUBBER DIVISION, A.C.S., *at Buffalo, Meets for Two-Days' Session*

Over 200 in Attendance at Meetings and Banquet—Next Meeting to Be Held at Detroit in February—Bridgwater Elected Chairman, Sebrell Vice-Chairman

THE annual meeting of the Rubber Division held in Buffalo on September 2 and 3, in conjunction with the eighty-second meeting of the American Chemical Society ended with the election for the ensuing year of E. R. Bridgwater and L. B. Sebrell as chairman and vice-chairman, respectively.

The Rubber Division met at the Lafayette Hotel while the main headquarters of the Society were at the Hotel Statler. Registration facilities were available at both hotels with the result that Rubber Division members did not find it necessary to visit the Statler except to attend meetings of other divisions when necessary.

Over 200 members and guests were in attendance at the technical sessions held in the ballroom of the Lafayette. No changes in the program as announced were made and all papers scheduled were presented. (Complete abstracts were published in the August 25 issue of THE RUBBER AGE.) A resume of the titles of the papers, with their authors and company connections, is presented elsewhere on this page.

Following the reading of the final paper, Chairman Winkelmann announced that the executive committee had decided that the next meeting of the Rubber Division would be held in Detroit during the latter part of February, 1932, in place of the regularly scheduled spring meeting of the American Chemical Society which will be held in New Orleans. It was felt that a more centrally located city than New Orleans would bring about a larger attendance and the members present agreed that the change was a welcome one. Only twice before in the history of the Rubber Division have special meetings been called to replace the meetings scheduled to be held at the same time and place of the American Chemical Society—once several years ago when the Tulsa and Los Angeles meetings were replaced by a special meeting in Akron and the other in 1929 when the Minneapolis meeting was replaced by one held at Atlantic City.

The only committee report was that of Chairman Dinsmore of the Physical Testing Committee who stated that the committee had collected over 100 replies to its questionnaire, including some from the tire, boot and shoe, proofing and insulated wire divisions of the industry. These are being classified and tabulated and a more complete report would be made at a later date.

The secretary-treasurer's report showed a balance on hand, as of September 1, of $1,270.92 and a total group membership of 604. The report is published herewith.

The result of the election of officers was as follows:

Chairman—E. R. Bridgwater *(Du Pont)*
Vice-Chairman—L. B. Sebrell *(Goodyear)*
Sec.-Treas.—H. E. Simmons *(Akron University)*
Sergeant-at-Arms—E. H. Nahm *(Naugatuck)*

Executive Committee

N. A. Shepard *(Firestone)*
H. R. Thies *(Goodyear)*
S. M. Cadwell *(U. S. Rubber)*
W. N. Jones *(Goodrich)*
H. A. Winkelmann *(Palmer Gas)*

A rising vote of thanks was given to the outgoing officers and executive committee for the excellent work which they had done and the results accomplished during the past year.

The banquet of the division was enjoyed by about 225 members and guests. It was held at the Elks Club and in addition to an excellently served dinner an elaborate entertainment program was provided by the committee. The features of this portion of the evening consisted of a number of selections by the Buffalo News Harmonica Boys; several well received songs by our own Rubber Quartette (Park, Firestone; Dinsmore, Goodyear; De France, Goodyear; Tillinghast, N. J. Zinc.); a community sing of parodies on well-known chemists including Messrs. Winkelmann, Somerville, Simmons, Boggs, Wiegand, Bierer, Silver, Curtis and Bridgwater; singing and dancing acts, male and female, enjoyed by young and those not so young; a

Program of Papers

Division of Rubber Chemistry

Lafayette Hotel
Buffalo, N. Y.
September 2-3, 1931

1. Scorch Retarders and Scorch-Retarding Materials. H. R. Theis (*Goodyear Tire and Rubber Company*).
2. The Mastication of Rubber—An Oxidation Process. W. F. Busse (*B. F. Goodrich Company*).
3. Oxidation Studies of Rubber, Gutta Percha and Balata Hydrocarbons. A. R. Kemp, W. S. Bishop and P. A. Lasselle (*Bell Telephone Company*).
4. The Temperature Coefficient of Vulcanization. C. R. Park and R. B. Maxwell (*Firestone Tire and Rubber Company*).
5. The Influence of Zinc and Lead on the Rate of Cure of Stocks Accelerated with Tetramethyl Thiuram Monosulfide. H. C. Jones and H. A. Depew (*New Jersey Zinc Company*)
6. The Effect of Oxide of Iron Containing Soluble Ferric Sulfate on Rubber. J. W. Ayers (*C. K. Williams and Company*).
7. The Effect of Various Accelerators and Antioxidants on the Electrical Characteristics and Water Absorption of Vulcanized Rubber Insulation. J. H. Ingmanson, C. W. Scharf and R. L. Taylor (*Bell Telephone Company*).
8. X-Ray Evidence that Rubber Is a Two-Phase System. M. F. Acken and Wheeler P. Davey (*Pennsylvania State College*).
9. Compression Stress-Strain of Rubber. J. R. Sheppard and W. J. Clapson (*Eagle-Picher Lead Company*).
10. Measurement of the Average Particle Size of Fine Pigments. S. D. Gehman and T. C. Morris (*Goodyear Tire and Rubber Company*).
11. Behavior of Rubber under Repeated Stress. W. L. Holt (*U. S. Bureau of Standards*).
12. A Study of Flexing. A. M. Neal and A. J. Northam (*E. I. duPont de Nemours and Company*).

magician whose act would do credit to our Walter Grote, and three excellent wrestling matches.

The entertainment committee consisted of A. A. Somerville, E. B. Curtis, A. R. Lewis and M. Levin. The Banquet Committee was as follows: C. F. Smith, J. B. Bennett, H. E. Elden, C. H. Ellis. Both committee are to be congratulated on the excellence of the arrangements made for the evening's enjoyment by the members.

DR. H. E. HOWE

DR. C. L. PARSONS

Two Distinguished Guests at the Banquet

At the dinner as honored guests were Dr. H. E. Howe, Editor of "Industrial and Engineering Chemistry," and Dr. C. L. Parsons, Secretary of the American Chemical Society. Dr. Winkelmann took occasion during the dinner to express the appreciation of the division officers for the splendid cooperation and support given by local factory executives to the banquet and entertainment committees.

Attractive and useful remembrances were presented to every member and guest by a number of leading suppliers as follows:

Akron Standard Mold Co., rubber door stop;
J. M. Huber, Inc., compass rule;
National Rubber Machinery Co., tri-color pencil;
N. J. Zinc Sales Co., Zinc ash tray and snuffer;
C. J. Tagliabue Mfg. Co., Household thermometer;
United Carbon Co., automatic pencil;
R. T. Vanderbilt Co., copy of "Ballyhoo";
Wishnick-Tumpeer, Inc.; set bridge cards;
Anonymous donor, several reprinted literary classics and illustrations.

Report of Treasurer

Rubber Division, A. C. S.

Balance in the Bank, March 30, 1931 (Meeting at Indianapolis)		$1374.49
Dues and Subscriptions since March 30, 1931		353.31
		$1727.80
Expenditures:		
Translations	$262.72	
Ben Franklin Printing Company	33.75	
Mack Printing Company	4.44	
Multigraph Letters	12.20	
Postage, Telegrams, Office Equipment and Expenses	14.77	
Expenses to Indianapolis for Secretary-Treasurer	65.00	
Stenographic Services	60.00	
Foreign Money Order—not negotiable (Replaced with P. O. Order)	4.00	
		456.88
Balance in Bank, September 1, 1931 (Buffalo Meeting)		$1270.92

Secretary's Report

Total Membership of the Division		604
Members	379	
Associate Members	116	
Subscriptions	77	
Honorary Members	32	
	604	
Members who did not renew membership	38	
Associate Members who did not renew	24	
Subscriptions not renewed	18	
	80	

Among the papers presented at other divisions were two which were of interest to rubber chemists. One was by Thomas Midgley and associates at Ohio State University on "Natural and Synthetic Rubber." The other was entitled "An X-Ray Method of Studying the Nature of Gels" by Acken, Singer and Davey of Pennsylvania State College. Abstracts of these papers follow:

Division of Colloid Chemistry

An X-Ray Method of Studying the Nature of Gels

M. F. ACKEN, W. E. SINGER, AND WHEELER P. DAVEY

It is theoretically possible to have not only real gels, containing two phases, but also pseudo gels containing only a single phase. The pseudo gel would have to be made up of coiled molecules such as were described by Hauser, *Ind. Eng. Chem.* 21, 249-251 (1929), for rubber. This paper described a special apparatus which makes it possible to distinguish between the two cases by purely x-ray methods which do not destroy the specimen. The new method has so far only been applied in the case of rubber. It is applicable in the case of any rubber-like gel which can stand intermittent stretching and in which stretching produces a fiber structure.

Division of Organic Chemistry

Natural and Synthetic Rubber—VIII—
Products of the Destructive Distillation of Sodium Rubber

THOMAS MIDGLEY, JR., A. L. HENNE, AND A. F. SHEPARD

The pyrolysis products of synthetic (sodium) rubber have been compared with those of natural rubber. Compounds with five and ten carbon atoms again predominate. The methyl groups are unsymmetrically spaced in the molecule, as shown by the presence of xylenes other than the meta isomer. Benzene is formed, thus indicating that the benzene from the distillation of natural rubber is not due to the presence of a unit other than the isoprene unit in the natural rubber molecule. Certain completely saturated compounds are obtained, whereas none is formed from natural rubber. In this respect, and in the behavior of its ozonide, sodium rubber closely resembles over-vulcanized rubber. A cyclic structure is thought best to explain these peculiarities.

Albertoni Testing Machine

THE Goodyear autographic tensile testing machine, invented recently by George J. Albertoni, is now being offered to the industry through the Black Rock Manufacturing Company, Bridgeport, Conn. The machine is designed for the measurement of the tensile strength of rubber materials and is equipped with a mechanically operated stress-strain recording device.

The machine is easily adjustable for variations in gauge of the test piece cross-sections and corrects the slightest variations. It is capable of high speed performance, permitting 25 or more tests per hour.

The device is protected under patent rights assigned to the Goodyear Tire and Rubber Company, from whom the Black Rock Manufacturing Company has obtained license to manufacture and sell.

*Rubber Exchange Head Discusses the Market**

Considers the Present Distressed Situation in the Plantation Industry As Being Largely the Reaction From Restriction—More Than Half World Surplus Here

J. L. JULIAN

By J. L. JULIAN
President, Rubber Exchange of New York, Inc.

DEPENDENT as our petroleum, motor car, and rubber tire industries are upon crude rubber, this country is vitally concerned with conditions in the Far East where Dutch and British colonies produce over 95 per cent of the world's crops. The annual production of American plantations in Liberia and Brazil during the next five years is not likely to amount to over 2½ per cent of the total world's production. Harvests from cultivated rubber-bearing shrubs in Soviet Russia and from wild rubber trees in South America and Africa will likewise account for only a small percentage of the total world's crops.

The total area of estates and native gardens in British colonies is fairly well known as is the area of cultivated estates in the Dutch East Indies, but the total area of native gardens in the Dutch East Indies has been variously estimated by investigators. Since the investigations made by the United States Government in the Far East during 1923-24 there has been no comprehensive survey of actual conditions in the Far East although aerial surveys of the unknown areas have been strongly recommended by official observers whose estimates of native planted areas have had to be determined largely by guesswork.

Shortage Was Predicted in 1929

The American investigators in 1923-24 were under the necessity of thus estimating the Dutch and native areas. Basing his predictions presumably upon these estimates, no less an authority than President Hoover, then Secretary of Commerce, predicted a rubber shortage in 1928 and 1930. Today experts are predicting that the present superabundance of rubber will continue for the next several years.

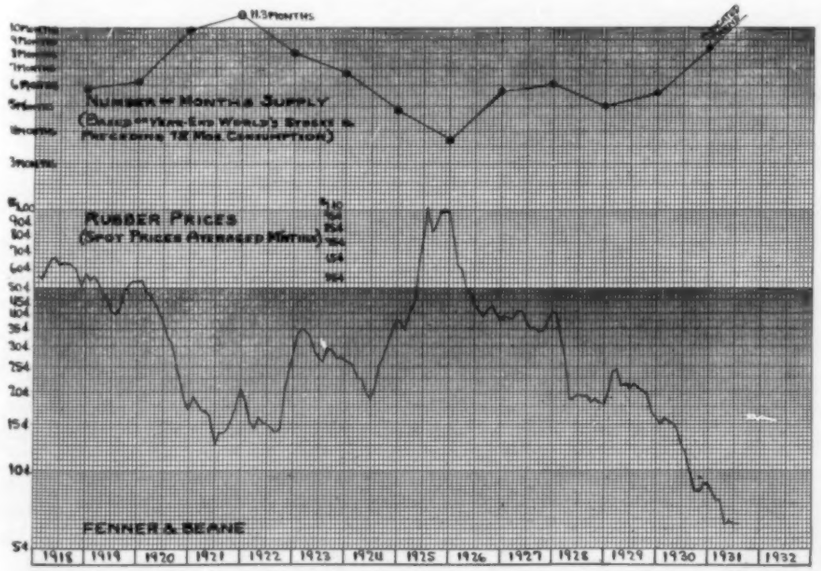
These more recent predictions are likewise based upon estimates of native areas in the Dutch East Indies as yet unsurveyed and may prove to be likewise misleading. Until the actual conditions in the Far East are more scientifically determined the price of crude rubber cannot be considered immune to the violent fluctuations that have characterized this commodity.

Restriction Talk

The present distressed condition of the rubber growers may be largely a reaction from the restrictive measures of the Stevenson enactment, and recurring talk about the resumption of restrictions has not discouraged overproduction. At present the Netherlands Government is considering the report of a committee of experts appointed to consider the existing critical conditions.

These experts do not agree as to the advisability of Government intervention, and it is to be hoped that the Netherlands Government, profiting by actual workings of the Stevenson enactment, will bear in mind that excessive supplies cannot be lessened with permanent benefit to the industry under Government or private control unless the steps leading to such reduction are based on the stabilization of prices at a level fair to consumer as well as producer.

*Reprinted from the *Journal of Commerce*, Aug. 10, 1931.



The Stevenson restriction act sent rubber to a price of around $1.25 per pound during 1925, and the graph to the left shows the market's most unstable performance occurred during the tenure of that act (1922-1928). Since that time the price trend has been downward, with very few recoveries, and the commodity is now selling at 5½c per pound in the New York spot market, due to steadily increased production. This level is far below production costs and few, if any, Far Eastern estates can produce without loss.

A statement made at this time that the Netherlands Government will not be a party to regulatory steps may bring about the collapse of estates that have entirely exhausted their resources by continuing to sell for a year or more their crops at prices below actual costs of production. These estates are probably larger in number than the farseeing estates which were content with a fair margin of profit and made forward sales when prices were higher.

Half of Surplus Here

Over half of the world's surplus of crude rubber is owned by American factories and importers. These holdings may not be found to be excessive if the large latent demand for tires in this country anticipated by the manufacturers materializes during the latter part of 1931 and during 1932. Similarly large stocks were held by American interests at the end of 1920 and of 1921. The inauguration of the Stevenson enactment on November 1, 1922, brought about a sharp advance in prices as did a voluntary agreement to restrict crops entered into by British producers in 1921. It may be found necessary for some regulatory measures to be adopted in the Far East to prevent a collapse of a large part of the rubber producing industry, inasmuch as at prevailing prices few, if any, estates can produce without loss.

Inasmuch as rubber is not an annual crop, but trees must be planted from four to six years before they can be tapped, it is important that the conservation of the rubber estates and gardens be assured, otherwise a period of superabundance of rubber may be followed by a period of scarcity. It is true that rested rubber trees will give a higher yield, but not if during a long period of enforced rest there has been no proper maintenance such as weeding, sanitary measures, etc.

It is not commonly understood that by far the bulk of the coolies employed to tap the rubber trees must be recruited in India and Java or drawn from trained workers immigrating into Malaya, Sumatra and Borneo from China. Once any large percentage of these coolies has emigrated back to their home countries, considerable time must elapse before they can be again recruited for service in the rubber-producing countries.

Exchange Facilities

At a critical time, such as this, it is particularly fortunate that farseeing individuals saw fit to establish a rubber exchange in this country, inasmuch as facilities are now available for hedging operations by members of the rubber manufacturing and affiliated industries. Neither is the individual who desires to invest in a commodity being sold below its cost of production prevented from making sound purchases of this nature.

An expert British commission, inquiring into trading on certain commodity exchanges, recently expressed the opinion that the informed speculator "performs a socially useful service, fully legitimate in its economic basis." The commission further stated: "He adds to the economic utility of the commodity dealt in.

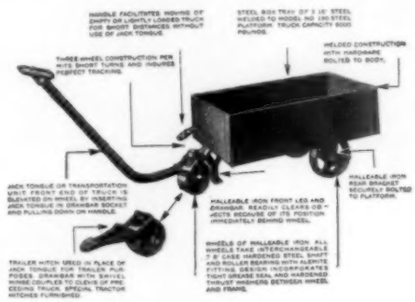
"Having, by careful study of the situation, formed a reasonable estimate of the probable future trend in the price of the commodity, he buys or sells according to his expectation of the rise or fall in price."

New Jak-Tung Truck

AN improved Jak-Tung truck for industrial and warehouse use has been announced by Howe Chain Company, Muskegon, Michigan. This improved truck uses as its basic principle the construction of the popular tote truck that has been marketed by this company for many years.

The Howe Jak-Tung truck is a simply designed unit well adapted for use as a hand truck or trailer, and for the temporary storage of materials. A body of hardwood or steel, suitably shaped for the product to be handled, is permanently attached to two rear wheels, with a malleable iron leg supporting the front. This represents the storage unit, immovable, self-contained, occupying but little more space than the materials carried.

For use as a hand truck, a Jack Tongue is inserted in



the draw bar, and a simple downward movement of the handle exerts a cam action, and elevates the front leg 1¼" from the floor, transferring the load to the jack tongue wheel.

I. R. I. Examinations

THE following were the questions asked at the recent examination for Institution of the Rubber Industry diplomas in general rubber technology, held in Manchester, Glasgow and London, June 1, 1931:

Examination in General Rubber Technology

(Five questions to be answered)
(Time allowed, 2½ hours)

Question 1. What are anti-oxidants? State how they are used and what is their value in a rubber compound.

Question 2. Give examples of the types of compounds in which you would use the following substances:

Carbon Black
Thermatomic Black
Lamp Black.

Question 3. State what you know about the official regulations relating to the use of litharge and other lead compounds in rubber mixing, and give a short account of methods employed to comply with these regulations.

Question 4. Give details of the use of dyestuffs in coloring rubber. State what you know of their suitability or otherwise and give examples of articles made.

Question 5. Describe briefly two different methods of manufacturing thin rubber sheets, and the type of articles they would be suitable for making up into. What differences due to the method of manufacture might you expect to find?

Question 6. In what type of compounds would you prefer to employ the following softeners, and state the reasons for your selection:

Stearic Acid
Pine Tar
Mineral Pitch.

Question 7. Describe the essentials of a spreading machine and how you would proceed to apply the first three coats of rubber to any particular type of fabric.

Question 8. How would you correct the following tendencies?

(a) Scorching while calendering.
(b) Rough surface of rubber from extruders.
(c) Porosity after vulcanizing.

Activities of Committee D-11, A. S. T. M.

THE Committee on Rubber, D-11 of the American Society for Testing Materials has summarized its activities for the coming year. Arthur W. Carpenter, manager, testing laboratories, B. F. Goodrich Company, Akron, is secretary of D-11.

Specifications are being prepared by Subcommittee I on hose, covering methods of test for various classes of hose including wrapped, braided, cotton rubber-lined and wire reinforced hose.

Subcommittee II on belting is preparing a specification covering the methods for testing rubber belting of various classes. It is anticipated that standard specifications for linemen's blankets will be prepared and submitted for approval during the coming year.

The Subcommittee on insulated wire and cable expect to progress sufficiently with a performance specification covering insulated wire so that it may be offered to the Society on a tentative basis during the next year. The section of the subcommittee charged with the preparation of the performance specification has completed preliminary work and drawn up a proposed specification which was discussed at Chicago. This subcommittee is very active in revising the present specifications on insulated wire and is cooperating with the National Electric Manufacturers Association.

Subcommittee IX on insulating tape, expects to undertake a thorough study and revision of both of the specifications under its jurisdiction. A number of criticisms have been made of the specification for friction tape, and tentative specification for rubber insulating tape. During the coming year, the subcommittee will investigate and revise both of these specifications so as to bring them strictly up-to-date.

The standard methods for testing rubber products (D-15) will be investigated by the subcommittee in charge. It is anticipated that method D-15 will be so revised as to constitute a separate specification on physical testing and to include only general physical testing methods as applied to rubber goods.

Life Tests

In Subcommittee XV, on life tests, standard methods are being prepared for the carrying out of the Geer oven aging and Bierer oxygen bomb tests. This work involves considerable investigation as to the present practices of the various rubber laboratories and will probably involve some actual laboratory comparisons as to the best conditions under which to carry out these tests. This is standardization work of extreme importance to the industry, and the subcommittee is cooperating with the committee on physical testing, of the Rubber Division of the American Chemical Society. The subcommittee has also just secured the final data from a three-year study attempting to correlate natural life with artificial aging tests and is engaged in a thorough digest of the rather volumnious data secured.

Vibration Absorption

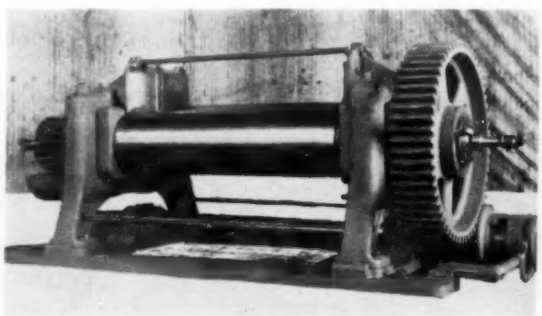
The committee on rubber products for absorbing vibration, will, during the next year, continue the work which it has in progress looking toward the development of a standard method for flow testing on rubber used for absorbing vibration. This work is of great importance in the automotive field and is complicated by the fact that nearly all automotive companies do considerable testing along these lines but rarely agree as to the methods which should be employed.

Subcommittee XVIII, on dynamic fatigue testing, is a new committee which has before it an important field for investigative work in test methods of the performance types. Such tests are those involving the effect on rubber goods of repeated stretching and repeated bending so carried out as to cause failures through fatigue. This work will likewise be of considerable duration, since little is now known regarding the causes of fatigue failures with rubber goods.

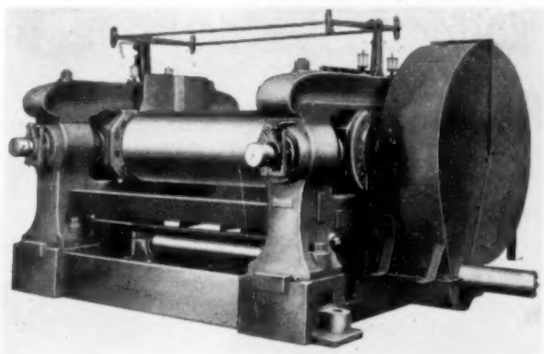
Old and New Models in Rubber Machinery

SOMEONE recently said, "Replacing industry's obsolete equipment with improved machinery and tools now available is the way to win this economic war and to rebuild prosperity." Certainly this is true of the rubber industry, where much old equipment is still in use—despite the availability of modern machinery which is more economical, more efficient and considerably safer than the old equipment. Machinery manufacturers are urged to send in old and new photographs of their equipment for possible use in this series.

The Editor, THE RUBBER AGE.



A Farrel 22 x 26 x 84 inch mill, built in 1899, with exposed gears and no safety devices. Compare this with the latest model shown in the accompanying photograph. The great improvement in the latest model, shown at the right, is very evident.



The modern Farrel-Birmingham mill is of much heavier construction and has many features not found in the earlier type, such as cut gears, fully enclosed and running in oil, safety mechanism, larger roll necks, self oiling bearings and self adjusting guides.

EDITORIAL COMMENT

Rubber Tires for Street Cars

SINCE the successful experiment recently carried on in France in rubber-tiring railway cars, the suggestion has been made that similar equipment on the general type of urban street cars, would go far to deaden the ofttimes terrific noise which all those must suffer who live or work along surface or elevated car lines. Such noises are particularly aggrevating at crossings and sharp curves. The success of the French motor-driven coach, which made 75 miles an hour with no more noise than the slight purr of the motor and the rush of wind, cannot help but stir the hopes of the jaded-nerved city dweller that herein may lie some relief for distraughted ear-drums.

The rubber tire with its metal flange grips the rail as securely as a railway wheel, but takes switches and curves so smoothly that there is no consciousness of high speed. One of the greatest advantages of the car is that it can pick up speed at short notice without any jerking. In this respect it is easily two-thirds more responsive than an ordinary train. Hence complicated signalling systems to avoid danger of crashes are not necessary and cars may be run at short intervals on the same line.

The practical value of this car will lie primarily in its use on suburban or other short runs. The cost of operation is very little compared with that of a heavy train, and a string of cars could be run over a line, stopping frequently, and at the same time assuring passengers comfort and quietness.

The application of this principle to street cars is certainly worth an effort and may have far-reaching possibilities, and at the same time, be contributing greatly to the elimination of unnecessary noise.

Restriction by Destruction

AMONG the many interesting proposals which are being brought forward for the alleviation of the plantation industry and the reduction of stocks, comes the suggestion that all the producing countries should impose an export tax on rubber, including native output, the proceeds of which would be devoted to the purchase of rubber in the open market and then destroying it unless it could be actually disposed of by sale at a profit.

This scheme, now put forward in revised form from two well-known sources, H. J. Welch, chairman of the Rubber Trust, London, and C. H. Brewster, also of London, originated as long ago as last February, when it was initiated by the financial editor of the *Manchester Guardian,* and attracted the attention of the Malayan government. It was based on the Brazilian coffee valorization scheme, which failed owing to the Government at the time borrowing money on the coffee it acquired instead of selling or destroying it, which latter measure is now being carried out. With regard to rubber it is suggested that an export tax of about 4 cents per pound would produce a fighting fund of $60,000,000, with which to purchase surplus stocks in the world markets, through an International Board of Control.

One criticism of this scheme is that if the Board of Control should hold its purchases, it would involve the undesirable piling up of stocks and that any rise in prices, which may occur sharply, would only incite producers to turn out as much rubber as possible. The stocks, however, would be in strong hands and could be burned if necessary, however uneconomic it might be to produce but to destroy.

In a recent letter to *The Times,* of London, H. J. Welch, in proposing his scheme on the lines of that outlined above, justified this destruction of surplus rubber by the analogy of a captain who, in a storm, is compelled to jettison part of his cargo in order to save the remainder, the ship itself and the lives of those on board.

Mr. Brewster, in setting forth his plan makes the following interesting comparison as to the advantages of "destruction" over "restriction."

Restriction	*Destruction*
Decreased output	Increased output
Higher costs	Lower costs
Labor restricted	Labor fully employed
A much higher price necessary to attain the same profit	An economic price can be obtained and maintained at no cost to anyone
A fluctuating and unstable market	Stability

THE RUBBER AGE

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

RUBBER FIRM EXHIBITS AT MEA-NSPA TRADE SHOW

It is announced that 229 manufacturers have already applied for space at the Joint Trade Show of the Motor and Equipment Association and the National Standard Parts Association at Atlantic City from December 7 to 12. It is expected that the total area devoted to exhibits at the 1931 show will exceed the amount used in 1930.

Among the manufacturers of rubber and allied products who have contracted for exhibit space are the Gates Rubber Company, Denver, Col.; Raybestos-Manhattan, Inc., Bridgeport, Conn.; Holfast Rubber Company, Atlanta, Ga.; L. H. Gilmer Company, Philadelphia, Pa.; Baldwin Rubber Company, Pontiac, Mich.; McKay Company, Pittsburgh, Pa.; Thermoid Rubber Company, Trenton, N. J.; Multibestos Company, Cambridge, Mass.; Dill Manufacturing Company, Cleveland, O.; and E. I. du Pont de Nemours & Company, Detroit, Mich.

GOODRICH MEN RECEIVE 20-YEAR SERVICE PINS

Eight B. F. Goodrich Company employes, six in Akron and two in Los Angeles, received 20-year service pins last month, it was announced by A. C. Sprague, Goodrich employment manager.

The awards were made to Allen Barrett, processing division; John Glennen, maintenance department; C. A. Scott, Philadelphia Rubber Works Company; John Welfley, tire division; Ernest Welton, plant protection; Charles P. Ross, mechanical division, and H. S. Carly and J. L. Kelley, Pacific Goodrich Company, Los Angeles.

New Firestone Ad Agency

The Firestone Tire & Rubber Company, Akron, O., has placed its advertising account with the Sweeney & James Company, 1632 Euclid Avenue, Cleveland, O., according to an announcement made September 1. Russell V. Cline, who served in the advertising department of the Firestone Company for 17 years, recently joined the Cleveland agency.

Sell Insulated Wire Plant

The plant of the Winsted Insulated Wire Company, Winsted, Conn., has been sold at auction for $15,000 to the Hudson Wire Company, Ossining, N. Y., largest creditor of the Winsted concern. It is understood that operation of the plant will be continued in Winsted by its new owners, if the sale is approved by the courts.

Rubber Boat Saves Eleven When Plane Sinks at Sea

Eleven persons, including three women, were saved from drowning by clinging to a rubber life raft for two hours August 27 after a Pan-American twin-motored amphibian plane, bound from Halifax to Boston, sank a mile and a half northeast of Halfway Rock, Gloucester, Mass., after making a forced landing in a fog. One passenger, a man of 70, slipped off into the sea and was lost.

Twenty minutes after the plane struck the water with such force that both pontoons were ripped off, it sank. During that time W. L. Elmore, the pilot, saved the lives of the eleven by retrieving the emergency rubber boat from the submerged cabin. Passengers and crew then took turns blowing into the boat until it was inflated.

Continue Tests on Akron

Dock tests on the U.S.S. Akron are proceeding normally and satisfactorily, according to the Goodyear-Zeppelin Corporation, and should be completed this week. The ship will then be submitted to the Navy for final inspection. She will be ready for flight tests when the final inspection is completed, corrections and adjustments made, and the crew familiarized with their duties. It is impossible, therefore, to give a definite date for the trial flights, the Goodyear organization states.

General to Make Lambert Tire

Purchase of all patents, molds and sales rights of the Lambert Trublpruf cushion tire has just been announced by the General Tire & Rubber Company. The General Tire Company is now in production on this tire and will offer it in eight sizes of the demountable type, five sizes of the "pressed-on" type and three sizes of the industrial truck type. The tire is said to have been popular with truck operators hauling coal and ice and similar commodities because of its dependability.

Goodyear Appeals Patent Suit

The Goodyear Tire & Rubber Company has filed in federal court at Cincinnati, O., an appeal from a ruling of the federal district court at Cleveland, O., in the patent infringement suit brought against it by the Overman Cushion Tire Company.

GOODYEAR GADSDEN UNIT WILL ELIMINATE WASTE

Inaugurating a campaign to reduce costs, the Gadsden, Ala., plant of the Goodyear Tire & Rubber Company has notified all employes to eliminate waste. It is pointed out that cord is shipped from Goodyear cotton mills wound on cardboard cones. At one time these cones were thrown away after the cord was used, but now they are returned to the cotton mills and used over and over again until worn out.

Standard size sheet of sandpaper or emery cloth is wound around buffing stocks on certain operations. When the exposed side was worn off the sheet was thrown away. By rewrapping the worn surface underneath double service is now obtained from every sheet. Other savings are being listed and while each item is small, the aggregate will be worth while, according to officials.

DU PONT DEVELOPS NEW RUBBERIZED COAT FABRIC

The Fabrikoid division of E. I. du Pont de Nemours & Company has developed a new sportswear coat fabric known as Cavaltex. It is made of a heavy rubberized material and it is stated to be the nearest approach in appearance and feel to genuine leather ever achieved in a coated fabric for garments. The material is said to be windproof and waterproof.

Manufacturers are making Cavaltex sports coats up now in various lines.

Another relatively recent du Pont development is a distinctly new type of finish which possesses remarkable durability and flexibility. The new product is radically different from paint, varnish, pyroxylin lacquer and other kinds of finishes, and tests have shown that it may be expected to protect surfaces from 50 per cent to 100 per cent longer than do even high grade covering products of the present day.

This finish, known as Dulux, is based on a synthetic gum or a synthetic oil, according to the purpose for which one or the other kind of the finish is intended.

Dayton Completes New Unit

Increased facilities for warehouse storage and shipping have been provided at the plant of the Dayton Rubber Manufacturing Company, Dayton, O., with the completion of a new $30,000 one-story structure, 160 by 180 feet in size, for those purposes. This is the ninth unit to be erected by the company since it moved to its present location in 1921. It will enable the company to carry a more complete stock of tires and belts at all times.

RUBBER EXPANSION JOINT DEVELOPED FOR HIGHWAYS

A rubber expansion joint for concrete roads which will prevent cracking under most extreme temperature has been developed by William R. Thompson, chief engineer for Goodrich Silvertown, Inc.

The rubber strip can be inserted under pressure when wood and steel construction joints are removed after the concrete hardens. The rubber joint will last the life of the road and will not protrude above the surface, it is said.

Loss from cracked highways aggregates several million dollars annually, highway engineers estimate.

Seiberling Companies Outing

A joint picnic of the Seiberling Rubber Company and the Seiberling Latex Products Company employes was held August 24 at Summit Beach Park, Akron, O. Men of the Seiberling Rubber Company defeated a team from the Latex organization by a score of 10 to 8, while other athletic and entertainment events featured the day's program.

DR. F. C. GREEN, chief of the aeronautic and marine department of the General Electric Company, Schenectady, N. Y., visited the Akron plant of the B. F. Goodrich Company on August 18. Arrangements for his visit to Akron were handled by S. M. JETT, the secretary of the B. F. Goodrich company.

WILLIAM C. YOUNG, manager of aeronautic sales for the Goodyear Tire & Rubber Company, was elected last month as aeronautic governor for Ohio for the National Aeronautic Society.

Eclat Rubber Company Picnic

Officials and employes of the Eclat Rubber Company and their families enjoyed a picnic August 17 at Lake o' Springs Park, North Canton, O. Athletic contests and other entertainment features were participated in by more than 250 persons.

Rubber Mats for New Hotel

Two huge rubber mats in vivid colors manufactured by the B. F. Goodrich Company have been placed in the lobby of the new Mayflower Hotel at Akron, O. The floor coverings, said to be made by a new process, feature reproductions of the ship after which the hotel is named and are the first of their type to be laid in Akron.

Firestone Builds Chicago Unit

The Firestone Tire & Rubber Company has started on the construction of a $350,000 branch office and service building at Wabash Avenue and Sixteenth Street, Chicago, Ill., present plans calling for the structure to be ready for occupancy early next February. Three-quarters of the first floor of the new building will be devoted to a service station for tires, gasoline, oil, greasing, car cleaning, brake testing and relining, and the sale of accessories.

Noah Estate at $1,189,606

The estate of Andrew Hale Noah, pioneer Diamond Rubber Company executive and a former director of the B. F. Goodrich Company, who died suddenly May 30, is valued at $1,189,606 in the inventory filed in probate court at Akron. The estate, according to the appraisal, includes $661,075 in securities and investments of that nature; realty valued at $129,150; cash totaling $32,017; personal goods listed at $16,682; and interests in various partnership enterprises valued at $50,681.

U. S. Rubber Reclaiming Ends No-Accident Year

THE factory of the U. S. Rubber Reclaiming Company, Inc., at Buffalo, N. Y., completed a full year without a lost-time accident on August 18. The plant in that time completed 416,718 man hours free from lost-time accidents. Preparations are now being made for another year of no lost-time accidents, and plans are being drawn up for the training of the new employe in regards to hazards that exist in the factory and also the training of foremen in teaching safety to the new employe.

The Plant Safety Committee is shown above with the safety flag. The management ascribes the success of its safety program to the interest and co-operation of the various departments with the efforts of this committee.

BRANCH OFFICE CHANGES BY FARREL-BIRMINGHAM

The Farrel-Birmingham Company, Inc., Ansonia, Conn., has opened a new office in Chicago at 1059 First National Bank Building, Monroe and Clark Streets.

The office is in charge of Harry Temporal, who was transferred from the Akron office. Mr. Temporal has been a sales representative of the company for 21 years, having first joined the Farrel Foundry & Machine Company at Ansonia in 1910. In 1922 he was transferred to the Cleveland office and in 1928 to the Akron office when the Cleveland and Akron offices were consolidated.

The Akron office, in charge of Andrew Hale, has been removed from the United Building to 2710 Central Depositors Bank Building.

Boston Hose Cuts Dividend

The Boston Woven Hose & Rubber Company, Boston, Mass., has declared a quarterly dividend of $1, payable September 15 to stock of record August 31, as compared to payments of $1.50 a share in previous quarters. This places the stock on a $4 annual basis as against $6 previously.

Weldon Roberts to Build

The Weldon Roberts Rubber Company, Newark, N. J., has awarded a contract for alterations to its factory in that city to Lorenz-Haase. The cost of the improvements planned will be approximately $40,000.

Rubber Stocks Fall Lower

Rubber company stocks, in sympathy with the decline in the rest of the market, closed the fortnight at slightly lower prices. General common dropped to a new low at 67, and Faultless common also touched a new bottom at 31⅜. The shares of the leading companies were generally steady, however, and showed only fractional declines in some instances.

Closing prices of the stocks of the principal companies in the industry on September 4, compared with the close on August 18 and with the high and low thus far reached in 1931, are shown in the following table:

	Last Price		—1931—	
	Sept. 4	Aug. 18	High	Low
Aetna	—	—	5	2
Ajax	—	—	½	¼
American Hard Rubber	—	—	35¼	30
Dayton "A"	—	—	—	—
Faultless	—	—	37	31⅜
Firestone	—	18	21½	13
do. 6% pfd.	62⅝	64	66¼	56¼
Fisk	⅝	⅜	⅞	⅝
do. 1st pfd.	—	—	3	1
General	67	—	140	67
do. pfd.	—	—	87½	76
Goodrich	11¼	13½	20⅞	8¼
do. pfd.	42	—	68	35
Goodyear	39	41¼	52¾	30⅝
do. 1st pfd.	—	84½	91	71
India	—	—	13½	8¾
Intercontinental	1⅝	—	4½	1¾
Kelly-Springfield	1¾	2⅛	3½	1⅝
do. 6% pfd.	—	—	45	35
Lee	—	3¾	4¾	2¼
Mohawk	—	3⅛	8	2¾
do. pfd.	—	—	35	25
Norwalk	—	—	1½	½
Pirelli	—	—	39¾	28¼
Raybestos-Manhattan	16¼	—	29½	16¼
Seiberling	5¾	6⅞	10¾	4⅝
do. pfd.	—	50	50	32
U. S. Rubber	12⅜	13½	20⅜	10¼
do. pfd.	21¼	25¼	36¼	17

C. Harold Smith

C. Harold Smith, one of the founders of the Binney & Smith Company, 41 East 42nd Street, New York City, and its president for many years, died August 31 in London, England. His career was one of the most romantic in modern industrial history.

Born in London 71 years ago, the youngest of a family of eight, he was forced to shift for himself at the early age of 15 when his father died. Like many British younger sons he was shipped alone to New Zealand with the hope of early fortune, but instead he passed through several thrilling and near-tragic experiences among the

wild Maori tribes as told in his book under the title of "Rhamedia."

He worked his way to San Francisco and across to New York, returning to England while still scarcely 17 years of age. Finding no better prospects there, he returned to New York where his fortunes turned from bad to worse and carried him to the verge of suicide. He finally secured a position wrapping packages in a lamp black concern, however, and from that time on his career took a steady upward trend.

Mr. Smith's efforts as a lamp black salesman were so successful that he was soon offered a partnership in the business and later took over the interest of his partner, opening his own first office at 17 Platt Street, New York. He was forced to move and located on South Street near Fulton and later on South near Catherine Street where fire gutted the building.

He was soon in operation again. In 1879 natural gas had first been used in the manufacture of carbon black in Ohio. Mr. Smith obtained the sales rights to the output of a large producer. Domestic sales increased rapidly, and in a short time agents were appointed in foreign countries. The introduction of the pigment into rubber compounding and its subsequent history are well known.

Mr. Smith was vice-president of the Columbian Carbon Company, producers of carbon black, and was a director of the Sebs Chemical Company, the L. Martin Company and the Peerless Carbon Black Company. His autobiography, "The Bridge of Life," caused much comment when published in 1929 and was followed this year by "The Highway of Success."

Names in the News

E. J. SMAIL, JR., of the Rubber Service Laboratories Company, returned last month on the S.S. Majestic from a two and a half month European tour, during which he visited Great Britain, France, Germany, Belgium, Italy, Austria, Hungary, Czechoslovakia, Holland and Switzerland. Mr. Smail called on the principal rubber companies in each country and visited all agents of his own organization through Europe. During a part of his trip he was accompanied by A. H. SMITH, European technical representative of the company.

A. F. RUCKS has been promoted by the C. J. Tagliabue Manufacturing Company, Brooklyn, N. Y., to general sales manager. He has been connected with the company for 18 years, serving as assistant to L. C. IRWIN, vice-president, during the past four years.

C. A. JESSUP has been appointed as a member of the manufacturers' sales department of the Firestone Tire & Rubber Company, according to an announcement by J. FRED CAST, manager of that department. Mr. Jessup will be associated with the Detroit office of the manufacturers' sales department, located in the Firestone Detroit District Building at Trumble and Grand Avenues in that city. He has had 20 years of experience in the rubber industry, spent chiefly in manufacturers' sales. Prior to joining the Firestone organization he served as a branch manager at Cleveland, Los Angeles, St. Louis and Detroit, and as manager of manufacturers' sales, located at Detroit, for the past seven years.

CLIFFORD C. SLUSSER, vice-president of the Goodyear Tire & Rubber Company, spoke at the noon meeting of the Shrine Club of Akron, O., on August 21. He commented on business conditions in various European countries, which he visited recently for the purpose of studying industrial affairs.

GEORGE MADOLE, assistant managing director of the Societe Francaise B. F. Goodrich, Colombes, France, visited the home offices of his company at Akron last month to study the latest developments in American tire manufacturing methods. Mr. Madole, formerly of Kent, O., and a worker in the experimental department of the B. F. Goodrich Company at Akron for several years, was accomanied by Mrs. Madole and their son, George, Jr.

NORMAN BEASLEY has just completed writing a history of the Goodyear Tire & Rubber Company, which will be published in December. Mr. Beasley is known as the author of "Freighters of Fortune," a book on the Great Lakes and shipping.

DOROTHY HESTER, twenty-year-old stunt flyer from Portland, Ore., presented a program of aerial acrobatics at the National Air Races at Cleveland, appearing as "Miss Silvertown" under the sponsorship of the B. F. Goodrich Company.

A. H. LEAVITT, formerly manager of the north-central district in the sales organization of the B. F. Goodrich Company, has been transferred to Buffalo, N. Y., in charge of the area constituting the Buffalo branch district. He has been associated with Goodrich for nearly twenty years and is the son of the late PERCY LEAVITT, an associate of DR. B. F. GOODRICH, the company's founder. Coming to Goodrich from Cornell, he worked in the mill room several years before entering the sales department. He was with GENERAL PERSHING in Mexico and later was purchasing agent for the United States government, returning to Goodrich six years ago. Another company change is the appointment of W. C. MANLEY to the Pittsburgh division, with territory covering western Pennsylvania, eastern Ohio, West Virginia and part of Maryland. Mr. Manley was formerly connected with the Diamond Rubber Company and the Firestone Tire & Rubber Company in sales and merchandising capacities.

M. W. CONANT has been appointed sales promotion manager for the Falls Rubber Company, Cuyahoga Falls, O. He was formerly public relations manager for the Miller Rubber Company and the B. F. Goodrich Company. Mr. Conant will now work under F. C. MILLHOFF, vice-president of Falls, and formerly his chief at Miller.

ROY MURPHY has been elected vice-president of the Corduroy Tire Company, Grand Rapids, Mich. He has been with the company ten years, beginning as purchasing agent and for some time recently acting as head of the mechanical rubber goods division. Mr. Murphy, who is 32 years old, is believed to be the youngest vice-president of any tire company in the country.

HUGH ALLEN, manager of the public relations department of the Goodyear Tire & Rubber Company, spoke before members of the Shrine Luncheon Club at the Akron Masonic Temple August 28 on the construction of the U.S.S. Akron. Mr. Allen was introduced by MARK L. FELBER, of the Goodyear publicity staff.

W. R. MCKINLEY, manager of Goodrich Silvertown, Inc., retail stores in Toledo, O., was a link in the "human chain" which saved many lives at Atlantic City several weeks ago when a 15-foot wave rolled over the beach without warning, taking several lives and injuring a score of people. Mr. McKinley, who with Mrs. McKinley was vacationing at the resort, was stunned by the wave but recovered sufficiently to assist in the rescue work.

C. S. REEVE, chief chemist of the Barrett Company, New York City, was scheduled to speak September 8 before the members of the New International Association for Testing Materials at Zurich, Switzerland. His subject was "Methods of Tests for Bituminous Materials."

Rubber News Around the World

MALAYAN RUBBER EXPORTS WERE LOWER IN AUGUST

Gross shipments of crude rubber from Malaya during August amounted to 42,832 tons, a cable to the Rubber Exchange reports. This figure was below earlier estimates, and compares with 43,658 tons exported by the chief producing country in July, and with 47,802 tons during August, 1930.

Ceylon shipments also were lower, amounting to 3,756 tons, as compared with 4.212 tons during July, and with 6,701 tons during August, last year. Of this amount, 2,796 tons were exported to the United States against 3,035 tons in July and 3,362 tons during August, a year ago.

Crop Destruction Proposals Succeed Restriction Plans

UNDER the stimulation of recent declines in crude rubber prices to the lowest levels in the world's history, sentiment for some form of general curtailment of production has increased steadily in the past few weeks. Previous proposals for restriction of output or exports, however, have been succeeded by drastic plans calling for the outright destruction of surplus rubber along the lines followed by Brazilian coffee interests and some domestic wheat growers.

Reports from London state that the Ceylon Rubber Industries Committee has submitted a memorandum proposing that Ceylon approach Dutch East Indian and Malayan rubber interests with a proposition for joint action to raise the price of rubber to 6d a pound in London. Under their suggested plan, exporters would surrender one ton of rubber for every two tons exported, with the surplus to be destroyed by the governments.

The outlook for a general curtailment of rubber output was also improved by Amsterdam advices stating that the Dutch East Indies government will probably be inclined to co-operate in a plan for restriction of production. While no details were given, it was stated that the new governor-general, who left Holland last month for the East Indies, would probably describe the government's new policy in his introductory speech. The governor-general, however, declined to engage in any conferences with British interests during his stop-over at Colombo, on September 6, en route to Batavia, stating that he would prefer to hear the Dutch version of the question first.

The "Brewster Plan"

Another curtailment plan was submitted to the International Association for Rubber and Other Cultivations in the Netherlands Indies last month by C. H. Brewster, of London, England, and has been submitted by that organization to its membership. The Brewster Plan, in the words of its author, follows:

"The governments of the producing countries to agree to an export tax on all rubber (including native). The proceeds of this tax to be used to buy rubber, which rubber will be destroyed, unless offers to purchase the rubber, at a nominal price, are forthcoming from municipal authorities or responsible manufacturing companies, under guarantee that the rubber should be used only for road or pavement making. The function of the tax will be threefold, either to raise, lower, or stabilize the price, and the raising or lowering the tax would obtain these results. The rubber would be purchased in the local markets, and would be duty free, and also would not have incurred freight and London charges; this latter is important, as it largely increases the amount of rubber which can be bought by the duty proceeds. The duty would start at (approximately) one penny per lb.; and an increase in the spot price of one penny would cause a corresponding increase of one half-penny in the duty, the basis being the average price of spot in the London market over any calendar month, but the International Control Committee would have power to vary the amount of increase or decrease under any exceptional circumstances."

Sees Instant Price Rise

In Mr. Brewster's opinion, adoption of such an agreement by the various governments would be immediately followed by a rush of "bears" to cover, which might raise the price by several pence per pound; but, as there would be plenty of rubber offering at the higher price, it would probably drop back to about 4d per pound (duty paid). Should this price obtain for, say, two months, about 50,000 tons of rubber would have been taken off the market, which would probably cause a rise, and the price might average 5d over the third month. Then in the fourth month the duty would be 1½d and at the end of this month over 100,000 tons in all would have been taken, and in another two or three months the end of the surplus would be in sight and the stabilizing of the price at an economic level would be a matter for consideration."

In conclusion, Mr. Brewster says: "If only the governments concerned will swallow the somewhat revolutionary pill of 'destruction,' the whole industry should flourish again in a few months. Can they hesitate if these are the facts? No government would hesitate to destroy cattle suffering with foot and mouth disease; why hesitate to destroy surplus rubber which is rapidly destroying a most valuable industry?"

FOOTWEAR EXPORT DROP HITS AMERICA HARDEST

Comparable statistics for exports of rubber footwear and canvas rubber-soled footwear for the first six months of 1931 show that the United States suffered a 52.2 per cent decline in its trade as against a 37.9 per cent drop for Canada and a 30.1 per cent decrease for the United Kingdom. The United States in that period exported 1,926,282 pairs of such rubber footwear as compared to 4,028,294 pairs in the first half of 1930.

Canadian exports totaled 2,850,245 pairs as against 4,586,624 pairs last year, while United Kingdom shipments amounted to 1,169,280 pairs against 1,673,760 pairs in the first six months of 1930. Other countries, including Germany, France, Belgium, Sweden, Austria and Poland, are important competitors, especially in the European footwear trade, and large quantities of rubber footwear are exported from Japan and British Malaya, but the export statistics are not available by countries in detail.

RUBBER DEVULCANIZATION WITH MERCURY PATENTED

O. G. Bohlin, of Helsingborg, Sweden, has secured an English patent for a process of rubber devulcanization with mercury. According to the specifications of his patent, vulcanized rubber is regenerated by treating it with mercury or its compounds in an amount less than that required to combine with the sulfur of the vulcanized rubber. In an example, waste vulcanized rubber is crushed and treated in a stirring vessel with a solution, sufficient to moisten the powder, of mercuric nitrate in half-normal nitric acid, the proportion of mercury being 0.5 per cent of the dry rubber. The rubber powder is then dried at 100-105° C., when reaction takes place. The partly liquid mass is then masticated and treated in the usual manner preliminary to vulcanization. In another example, a small quantity of metallic mercury or solid mercury salt is mixed with the ground rubber on hot rollers. The mass is then left for some hours at about 130° C. and regenerated, then finished in a rolling mill or masticator, preferably with the addition of a small quantity of raw rubber to assist plasticization.

Produces Latex-Treated Hair

Latex-treated hair for upholstery is among the items now being produced by Xetal Products, Ltd., Long Eaton, England. This material was first produced by P. Herbert Head, managing director of Xetal Products, Ltd., about eight years ago. It is, however, attracting considerably more attention at the present time, and the product itself is said to have been appreciably improved.

Rubber Goods and Specialties

Non-Skid Thorogrip Shoe

A new addition to the line of the Firestone Footwear Company, 141 Brookline Avenue, Boston, Mass., is the Non-Skid Thorogrip shoe, especially designed for basketball and scientifically constructed to meet the requirements of the modern type of game. It differs from the company's regu-

lar Thorogrip shoe in that it has a special molded non-skid pivot sole. The shoe is of white duck with black trim, with alternative color combinations of brown with grey or suntan with green. It is full height and of lace-to-toe construction, with ribbed toe bumper, reinforced toe cap, cushion heel and arch. The insole of Armstrong cork keeps the feet from blistering.

Airian Air Mattress

Airian air mattresses were placed on sale at Gimbel Brothers, Inc., in New York, on July 27. The air-bags for these mattresses are manufactured by the Seiberling Rubber Company of Akron, O., for the Airian Prod-

ucts Corporation, 233 Broadway, New York City.

These bags are covered either with Belgian linen or with ticking covers, upholstered with a cotton pad on top and laced on the bottom, so that the covers can be readily removed and laundered, if soiled.

The bags themselves are made in two styles—the Airian, shaped with vulcanized rubber rivets or "grommets," giving a depth of about five inches when inflated, and the Luxairian with tubes giving an inflation depth of approximately eight inches.

These mattresses hold their shape under very low inflation—less than a pound air pressure—which adds materially to their comfort. Due to the ventilation, afforded by the tubes and perforated grommets and to the padding which keeps the body from close contact with the rubber, these mattresses are cool to sleep upon, even in the hottest weather.

Their lightness and the fact that they never need turning, since they do not develop humps or hollows, is attracting the attention of housewives, while camps are showing an interest in them both on account of their comfort and the small space in which they can be stored when not in use.

Airian air-bags are made of the best grade of inner tube rubber, specially treated to eliminate rubber odor, with all seams vulcanized.

Tire Pressure Device

A new tire pressure device, perfected by a Swiss engineer and developed in Argentina, was recently exhibited at Buenos Aires. This device permits of the lowering or raising of the tire pressure while the car is in motion and also maintains tire pressure in spite of frequent punctures. The device is called "Airrex S. V. H." and the inventor is George C. Shuele Von Hilvety, Rioja 591, Buenos Aires, Argentina.

GOODRICH MAN DESIGNS NEW LAWN SPRINKLERS

An innovation in lawn sprinklers is being manufactured by N. L. Hood, 514 Vinita Avenue, manager of the mechanical inspection department of the B. F. Goodrich Company. Hood's development is an application of the inner tube valve and is being manufactured by one of the major valve companies.

Three of the sprinkler units are installed in a 25-foot length of garden hose and any number may be used at one time. The unit is inserted through a small hole in the hose and locked in place similar to the method used in securing tube valves.

A small screw regulates the spray and a removable metal clamp holds the hose in position. By regulating the hose nozzle the entire stream is sent through the sprays. When the sprinklers are not in use the set screws are turned down and the hose may be used as a regular garden hose.

Goodrich has sponsored the patent and the product is manufactured as the Goodrich "Multispray". The valves throw a 12-foot spray under normal water pressure.

Servus Propr-Bilt Play-Kicks

An entirely new line of canvas rubber-soled footwear is now being manufactured by the Servus Rubber Company, Rock Island, Ill., under the name of Propr-Bilt Play-Kicks. These shoes are especially designed to meet the conditions created by the prevalence of brick and concrete playgrounds

and even hard surfaced tennis courts. In addition to an exclusive arch feature, this new line has snug fitting instep and heel, ample toe room, metatarsal support and a generally attractive appearance. The design of the heel is claimed to have been especially constructed to prevent and overcome pronation.

Basket-Surf-Playground Ball

Of basketball design and size, this play ball with patented closure valve is the newest addition to the line of the Miller Rubber Products Company, Inc., Akron, O. The ball is made of pure, pliable rubber that has a stretch, giving the ball the extreme in

bounce, according to the manufacturer. The valve is easily operated by any one. Pressed in place after the ball is inflated, it seals the ball so that no air can escape for a practically indefinite length of time.

Current Crude Rubber Items

NEW YORK RUBBER TRADE HONORS KIYOSHI MIYAZAKI

Members of the New York rubber trade suspended market activity for an hour on August 27 to join in a farewell luncheon to Kiyoshi Miyazaki, manager of the crude rubber department of Mitsui & Company, who is severing his American connections to take up his duties at the central Mitsui organization in Japan next month.

The affair was held at the India House, where the dining room was decorated with American and Japanese flags for the occasion. William E. Bruyn of L. Littlejohn & Company was the toastmaster.

As spokesman for the rubber trade, Mr. Bruyn informed the guest of honor of the high esteem and regard he had merited in the trade as a rubber dealer and good fellow. Mr. Miyazaki is leaving the rubber trade with an "equity" of good-will, Mr. Bruyn said, due to his high ethical standards of business conduct, and a code of fair dealing which accounted for his success as a business man as well as a sportsman. The Mitsui manager was champion of the local rubber trade golfers.

In reply, Mr. Miyazaki quoted an Oriental rule for success which demands that a man's love be given first to his wife; secondly to the world, and thirdly to the place of his birth. So pleasant has been his stay in America, however, and so many are the new and last friendships made here, that he has been forced to regard America as a "second home," one which he regrets to leave.

Mr. Miyazaki was presented with a silver cigarette case as a memento of esteem from the rubber trade, and inscribed as such, while the farewell greetings and wishes of the rubber fraternity to the guest of honor were incorporated in an illuminated parchment, signed by more than fifty members of the trade who were present.

The luncheon was arranged by a committee consisting of Clifford C. Johnston of Fenner & Beane, Lawrence Odell of Munds & Winslow, and William Murphy of John L. Handy & Company. John L. Julian, president of the Rubber Exchange of New York, was honorary chairman.

EXCHANGE DIFFERENTIALS FIXED FOR SEPTEMBER

The adjustment committee of the Rubber Exchange of New York on August 17 fixed the price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries against old "A" contracts for the month of September as follows: off quality first latex crepe at one-tenth of a cent a pound; good F. A. Q. ribbed smoked sheets at two-tenths of a cent a pound; ordinary F. A. Q. ribbed smoked sheets at thirty-five one-hundredths of a cent a pound.

On August 26, the committee fixed differentials against the new "A" contracts for September as follows: No. 2 crepe (thick or thin) at 10 points; No. 2 ribbed smoked sheets at 9 points; No. 3 ribbed smoked sheets at 20 points; No. 4 ribbed smoked sheets at 30 points; No. 5 ribbed smoked sheets at 50 points; limit of allowance on No. 2 crepe at 25 points; allowance on rubber delivered in bales at 13 points.

Sponge Rubber Glass Holders

The problem of the glasses for summer beverages marking up tables and dripping upon clothing has been responsible for the introduction in the United Kingdom of low cups of sponge rubber selling for sixpence and containing enough space to absorb the moisture. These cups are reported to be of Czechoslovakian origin and are well made in various pastel shades. A small flower of the same sponge material decorates the sides, and the broad base is said to give a steady resting place for tall glasses on tea wagons bumping across the lawn.

Exchange Nominating Committee

Jerome Lewine, of H. Hentz & Company, is chairman of the nominating committee appointed by the board of governors of the Rubber Exchange of New York on August 31 to name candidates for all offices to be filled at the next annual election of the exchange. Other members of the committee include Arthur L. Dunn, of F. B. Peterson & Company; I. Henry Hirsch, of Adolph Hirsch & Company; Henry Perlish, of C. T. Wilson & Company; and Marcus Rothschild, of M. Rothschild & Company.

Footwear Output in Chosen

Rubber shoes manufactured in Chosen (Korea) during 1930 amounted to over 8,000,000 pairs. During the same period rubber consumption totaled 2,200 metric tons.

MERILLAT EXPORT HEAD FOR F. S. CARR COMPANY

The F. S. Carr Company, 31 Beach Street, Boston, Mass., manufacturer of rubberized fabrics, raincoat materials, artificial leathers and specialties, has reorganized its export department, appointing L. A. Merillat, Jr., as export manager. Mr. Merillat, who is widely known in export circles, has organized the department with a staff of experts to take care of the growing export business of this concern.

The company's present line consists of automobile top and curtain materials, seat cover materials for protecting upholstery, artificial leather in different weights for novelties, baggage, upholstery, etc., and Carrtex, which is used for shoe quarter lining. In its Carrcohyde, an artificial leather, the company employs rubber in the double-texturing process. New products are being added from time to time.

RESTRICTION PROPOSALS BY DUTCH COMMITTEEMEN

The four pro-restriction members of the Dutch Rubber Committee have just announced proposals which they have placed before the Dutch Colonial Office. These proposals are to the effect that each of three producing countries should be allotted a basic quota to remain in force for twelve months and then to be revised according to conditions prevailing in each area.

It is claimed that this plan provides (1) for co-operation between three leading producing countries—Dutch East Indies, Ceylon and Malaya—on an equal basis; (2) equal treatment of controllable and uncontrollable rubber, both these being subject to like restriction of exports which in the case of native growers will be practically the restriction of production; (3) guarantee of 1930 standard living of Dutch Indian native producers; (4) taking into account of individual producing capacity in controllable areas, and (5) the prevention of the formation of stocks in producing countries. The plan is based on the principle of restriction of 25 per cent.

FOREIGN RUBBER STOCKS INCREASED DURING JULY

In addition to the heavy rubber supplies on this side, stocks of Far Eastern dealers also are growing, figures cabled to The Rubber Exchange of New York, Inc., reveal. Such stocks amounted to 43,831 tons at the end of July, compared with 43,010 tons at the close of June, and with 39,461 tons during July, 1930.

Ribbed smoked sheets held by the dealers in July totaled 26,056 tons; crepe, 13,272 tons; unsmoked sheets, 2,947 tons, and scrap and lump rubber, 1,556 tons.

Great Britain in former years re-exported large quantities of rubber to the United States, but such shipments amounted to only 5 tons during July, a London cable reported. Britain's July imports totaled 8,972 tons, and total exports 3,606 tons.

Protest Consumption Estimates

Symington & Sinclair, London rubber brokers, have challenged the estimates of world rubber consumption for 1931 made by the Dutch Rubber Committee and corresponding to previous estimates by the British Rubber Growers' Association. The figure set by these two bodies was 734,000 long tons, but Symington & Sinclair in February estimated world consumption at between 675,000 and 690,000 long tons and now believe the lower figure to be nearer the mark. "For this reason," they state, "we consider it deplorable that a figure about 60,000 tons in excess of reasonable probability should be given out with the apparent authority of the two most important bodies on the producing side of the industry."

WAGES ARE INCREASED BY MONSANTO CHEMICAL UNIT

During a period of prevalent wage cuts Monsanto Chemical Works, at its St. Louis plant, has undertaken a successful experiment in wage increases. During the second quarter of 1931, the average hourly rate paid on Monsanto's St. Louis plant, to production labor increased 10.4 per cent over the average hourly rate paid in the second quarter of 1929, yet the labor hours consumed per unit of output declined 23.7 per cent, and the labor cost per unit of output declined 15.5 per cent in a comparison of the same two periods. Due to a smaller output in 1930, comparison with similar period of that year is even more favorable.

In explanation, Edgar M. Queeny, president, stated, "The chemical industry has never paid top wages to its operating workers, who have been recruited largely from the common labor group and then trained to operate chemical equipment. We felt that with a large surplus of high type of labor available we were accorded an opportunity to raise the standard of the average worker in our plants. The 1929 wage rate, we felt, would not be sufficient to hold a high type man permanently if and when business returned to its former level of activity. We, therefore, set a scale which we believe would continue to attract the best of unskilled men in normal times, systematically weeded out the less efficient of our workers and replaced them with the cream of the many applicants that appear at our employment office every morning.

"The experiment has been distinctly successful and barring a further slump in the chemical markets, or further downward adjustment of costs of living, which we do not anticipate, or other unforseen conditions, we feel there is no justification to lower our prevalent wage scale.

"Our new policy has given us the benefit of lower labor costs and a better grade of employes, and employes who have effected this saving are receiving approximately 40 per cent of it in increased hourly rates."

Mohawk Rubber Annual Outing

Office and factory employes of the Mohawk Rubber Company held their annual outing at Summit Beach Park, Akron, O., on August 17, a crowd of more than 1,000 participating in the sports and entertainment program. N. E. Reese acted as general chairman of the picnic committee in charge of the event.

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Plymouth Rubber to Expand

The Plymouth Rubber Company, Canton, Mass., has awarded a contract for additions and alterations to its factory unit No. 9 to the Platt Construction Company, Waltham, Mass. The cost of the expansion is estimated at $40,000. The company manufactures tubes, flooring, soles, bathing accessories, sanitary goods and other rubber products.

American Cyanamid Profit Down

The American Cyanamid Company and subsidiaries report for the year ended June 30 a consolidated net profit after depreciation, depletion, interest, federal taxes, minority interest and other charges of $548,669, equal to 22 cents a share on combined class A and B stocks, including that reserved for shares not yet exchanged. This compares with earnings of $4,618,099, or $1.86 a share on combined stocks, in the preceding twelve months.

GOODYEAR STILL MAKES TIRES FOR CARRIAGES

After 33 years in the business of making tires, pioneering tire development for trucks, buses, passenger cars and even aircraft, the Goodyear Tire & Rubber Company is still making one of its original products—carriage tires, a solid rubber tire applied to the wheels of buggies and carriages in this and other nations.

Horsedrawn buggies are still in wide use in the mountainous sections of some states where paved roads have not yet penetrated, and the bulk of the market lies in the mountainous states, although there is a widespread use that covers nearly every state in the Union.

In Michigan, for instance, home of the automobile, there is a good market, because no automobiles are allowed on the highways of historic Mackinac Island, and on the inside and outside drives, horse drawn vehicles still carry the sightseer.

Solid rubber tires are exported by Goodyear to India and China where the victorias are smart equipages even amid the trend toward motor cars. There are even some jinrikishas, man-propelled, which are equipped with these solid tires, and Goodyear makes the pneumatic 'rikisha tire as well.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, SEPTEMBER 4, 1931

Crude Rubber

DURING the month of August the average of the daily closing prices for smoked ribbed sheets at New York was 5.38 cents a pound, establishing a new low record and comparing with 6.37 cents in July and with 9.96 cents in August, 1930. The continuance of five-cent rubber is having its effect in a movement among producing interests for the radical step of destruction of a portion of existing stocks.

Prices quoted on the New York outside market at the close September 4 follow:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Sept.	.05	@	.05⅛
October	.05	@	.05⅛
Oct.-Dec.	.05	@	.05⅛
First Latex, crepe spot	—	@	.05⅝
Amber Crepe, No. 2	.04⅝	@	.04⅞
Amber Crepe, No. 3	.04⅝	@	.04⅞
Amber Crepe, No. 4	.04⅝	@	.04¾
Brown Crepe, Clean thin	.04⅝	@	.04¾
Brown Crepe, rolled	.04¼	@	.04½
Liquid Latex, per gal.	.70	@	.80
Paras—			
Up-river, fine	.07	@	.07⅛
Up-river, coarse	Nominal		
Acre Bolivian, fine	.07¼	@	.07⅜
Caucho Ball, Upper	Nominal		
Centrals—			
Central scrap	.06	@	—
Esmeraldas	.06	@	—
Balata—			
Block, Ciudad	—	@	.30

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-Sept.	2¼	@	2⅜d
October	2¼	@	2⅜d
Oct.-Dec.	2⅜	@	2½d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot	—	@	2d

Daily closing prices and sales on the Rubber Exchange of New York follow:

Reclaimed Rubber

Reclaim prices continued depressed by the low quotations for crude rubber. During July, exports of reclaim totaled 415 tons, valued at $40,610, or 4.37 cents a pound as against an average value for June exports of 4.49 cents a pound. Late prices follow:

High Tensile				
Super-Reclaim Black	lb.	.06	@	.06¼
High Tensile Red	lb.	.06¼	@	.06½
Shoe				
Unwashed	lb.	.05¼	@	.05½
Washed	lb.	.06½	@	.06¾
Tube				
No. 1 (Floating)	lb.	.07½	@	.08
No. 2 (Compounded)	lb.	.06	@	.06½
Tires				
Black	lb.	.04¾	@	.05⅛
Black, selected tires	lb.	.05	@	.05¼
Dark Gray	lb.	.06	@	.06¼
Light Gray	lb.	.06¼	@	.06½
White	lb.	.07½	@	.07⅝
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½
Miscellaneous				
Mechanical blends	lb.	.03¾	@	.04⅛

Scrap Rubber

The continuance of bottom levels for crude rubber is holding the scrap rubber market down to the lowest prices in history. The latest quotations for the different grades of scrap rubber closed the fortnight as follows:

(Prices to Consumer)

Auto tire peelings	ton	19.00	@21.00
Mixed auto	ton	8.00	@ 9.50
Bicycle tires	ton	5.00	@ 6.00
Clean solid truck tires	ton	22.00	@23.50
Boots and shoes	cwt.	.87½	@ 1.00
Arctics, untrimmed	cwt.	.40	@ .50
Inner tubes, No. 1	lb.	.03¼	@ .03⅝
Inner tubes, No. 2, compounded	lb.	.01⅞	@ .02
Inner Tubes, Red	lb.	.01½	@ .01⅝
Air Brake Hose	ton	9.00	@10.00
Rubber Hose	ton	8.50	@ 9.00

Cotton

DURING the month of August the average of the daily closing prices for middling upland cotton on the New York spot market was 7.21 cents a pound, the lowest figure for years. This compares with average prices for July of 9.28 cents a pound and for August, 1930, of 12.03 cents a pound. The market is still laboring under the effects of the government crop estimate of 15,584,000 bales.

High, low and closing prices on the New York Cotton Exchange September 4 follow:

	High	Low	Close	Close
		Sept. 4		Aug. 18
Oct.	6.79	6.64	6.65	6.82
Dec.	7.00	6.87	6.89	7.03
Jan.	7.09	6.96	6.96	7.13

Tire Fabrics

The continuance of low prices for raw cotton is keeping tire fabric quotations at low levels. Current prices for the various grades are as follows:

(Prices Net at the Mill)

CORD			
Peeler, carded, 23/4/3	lb.	.25½	@ .26
Peeler, carded, 23/5/3	lb.	.24½	@ .25
Peeler, carded, 13/3/3	lb.	.22	@ .22½
Peeler, carded, 15/3/3	lb.	.22½	@ .23
Egyptian, carded, 23/5/3	lb.	.35	@ .36
Egyptian, combed, 23/5/3	lb.	.40	@ .40½
CHAFERS			
Carded, American, 8 oz.	lb.	.23	@ .23½
Carded, American, 10 oz.	lb.	.23	@ .23½
Carded, American, 12 oz.	lb.	.22½	@ .23
Carded, American, 14 oz.	lb.	.20½	@ .21
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.20	@ .25
Carded, American, 10¼ oz.	lb.	.20	@ .25
SQUARE WOVEN			
Carded, American, 17¼ oz. 23-11 ply	lb.	.24½	@ .25
Carded, American, 17¼ oz. 10-ply	lb.	.20½	@ .21

Sheetings

The sheetings market again dropped fractionally, touching new low levels, in sympathy with the decline in raw cotton. Latest prices follow:

40-inch, 2.50-yard	yd.	—		.06
40-inch, 2.85-yard	yd.	.05⅝	@	.05⅝
40-inch, 3.15-yard	yd.	—	@	.06⅛
40-inch, 3.60-yard	yd.	—	@	.05⅞
40-inch, 3.75-yard	yd.	—	@	.04⅞
40-inch, 4.25-yard	yd.	—	@	.04

Ducks

Price quotations for hose and belting ducks declined during the fortnight from one to two cents a pound, bringing them down in accordance with the drop in other grades two weeks ago. Late prices follow:

Belting and Hose	lb.	.20	@	.21
Enameling	lb.	.18	@	.19
Single filling	lb.	.08¾	@	.09
Double filling	lb.	.09½	@	.09¾

Closing Prices on Rubber Exchange of New York, Inc.

FROM AUGUST 19 TO SEPTEMBER 3, 1931

		Spot	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sales
No. 1 Standard Contract of 10 Tons															
Aug.	19	5.20	5.17	5.24	5.32	5.40	5.47	5.54	5.62	5.70	5.78	5.86	5.94	——	66
	20	5.30	5.25	5.32	5.39	5.46	5.53	5.61	5.69	5.76	5.83	5.90	5.98	——	84
	21	5.15	5.07	5.14	5.22	5.30	5.36	5.43	5.50	5.57	5.65	5.72	5.80	——	55
	22	5.10	5.03	5.10	5.16	5.22	5.28	5.35	5.42	5.51	5.60	5.69	5.78	——	65
	24	5.10	5.05	5.13	5.21	5.29	5.37	5.45	5.53	5.61	5.69	5.77	5.85	——	64
	25	5.05	5.00	5.08	5.17	5.26	5.32	5.39	5.47	5.54	5.62	5.70	5.78	——	44
	26	5.00	4.96	5.03	5.11	5.18	5.25	5.32	5.40	5.47	5.55	5.62	5.70	——	61
	27	4.95	4.90	5.00	5.06	5.13	5.20	5.27	5.35	5.43	5.52	5.59	5.67	——	61
	28	4.95	4.89	4.96	5.03	5.11	5.18	5.25	5.32	5.40	5.48	5.56	5.65	——	69
	29	4.95	4.88	4.95	5.02	5.08	5.15	5.22	5.30	5.39	5.48	5.55	5.63	——	27
	31	5.02	4.93	5.00	5.07	5.15	5.22	5.30	5.38	5.46	5.54	5.61	5.68	——	46
Sept.	1	5.00	4.86	4.93	5.00	5.08	5.16	5.23	5.31	5.38	5.46	5.54	5.62	5.72	53
	2	5.00	4.90	4.97	5.03	5.10	5.17	5.24	5.32	5.40	5.49	5.56	5.63	5.72	98
	3	4.95	4.88	4.94	5.00	5.05	5.12	5.19	5.26	5.33	5.41	5.49	5.56	5.66	44
Old "A" Contract of 2½ Tons*															
Aug.	19	——	5.10	5.10	5.20	5.20	5.45	5.52	5.60	5.68	5.76	5.84	5.92	——	16
	20	——	5.20	5.20	5.30	5.40	5.51	5.59	5.67	5.74	5.81	5.88	5.96	——	——
	21	——	5.00	5.10	5.10	5.20	5.34	5.41	5.48	5.55	5.63	5.70	5.78	——	3
	22	——	4.90	5.00	5.10	5.10	5.26	5.33	5.40	5.49	5.58	5.67	5.76	——	119
	24	——	4.90	5.00	5.10	5.10	5.35	5.43	5.51	5.59	5.67	5.75	5.83	——	1
	25	——	4.90	5.00	5.10	5.10	5.30	5.37	5.45	5.52	5.60	5.68	5.76	——	14
	26	——	4.90	5.00	5.10	5.10	5.23	5.30	5.38	5.45	5.53	5.60	5.68	——	11
	27	——	4.90	4.90	5.00	5.10	5.18	5.25	5.33	5.41	5.50	5.57	5.65	——	22
	28	——	4.90	4.90	4.90	5.00	5.16	5.23	5.30	5.38	5.46	5.54	5.63	——	22
	29	——	4.80	4.90	4.90	5.00	5.13	5.20	5.28	5.37	5.46	5.53	5.61	——	43
	31	——	4.90	4.90	4.90	5.00	5.21	5.29	5.37	5.45	5.53	5.60	5.67	——	1
Sept.	1	——	4.80	4.90	4.90	5.00	5.14	5.21	5.29	5.36	5.44	5.52	5.60	5.70	5
	2	——	4.80	4.90	4.90	5.00	5.15	5.22	5.30	5.38	5.47	5.54	5.61	5.70	8
	3	——	4.80	4.80	4.90	5.00	5.10	5.17	5.24	5.31	5.39	5.47	5.54	5.64	——

*Quotations for months after December, 1931, are for New "A" Contract.

CHEMICALS

SUPPLIERS of rubber chemicals and compounding ingredients are looking forward to a demand for the remainder of the year that should be at least higher than for the same period of 1930. Producers of the best known brands of chemical materials have not suffered so greatly in sales and profits as have manufacturers in other industrial fields, and a few find their earnings higher than last year. The price structure for all types of rubber chemicals has remained firm during the past fortnight.

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.		
Aniline oil, drums, f.o.b. works	lb.	.14½@	.16
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
Pipsol	lb.	4.50 @	4.50
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.07¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾@	.10
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Venetian red	lb.	.08 @	.06
Vermillion, quicksilver, English	lb.	1.75 @	1.80
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Asolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanium oxide	lb.	.21 @	—
Titanox B, f.o.b. St. Louis,	lb.	.06½@	.07
Titanox C, f.o.b. St. Louis,	lb.	.07 @	.07½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Horsehead Brand:			
Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅜@	.10⅞
blue label	lb.	.09⅜@	.09⅞
red label	lb.	.08 @	.08½
St. Joe, black label	lb.	.06½@	.07
red label	lb.	.06½@	.07
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.06½@	.07
Anaconda, selected lead free	lb.	.07 @	.07½
White seal	lb.	.11⅝@	.11⅞
Green seal	lb.	.10⅜@	.10⅝
Red seal	lb.	.09⅝@	.09⅞
Yellows			
Chrome	lb.	.16½@	.17
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01¾@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blacks			
Arrow "Aerofloted"	lb.	.03½@	.08½
Bone Black	lb.	.06 @	.12½
Carbon, compressed	lb.	.03 @	.07
Carbon, uncompressed	lb.	.03 @	.07
Disperso, f.o.b. Louisiana	lb.	.03½@	—
Disperso, f.o.b. Texas	lb.	.036 @	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.03½@	.07½
Excello, compressed	lb.	.04 @	.08
Gastex, f.o.b. Texas	lb.	.03 @	.06
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.03½@	.08½
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.03½@	.08½
Velvetex carbon	lb.	.03 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	8.00 @	20.00
Colloidal	lb.	.05 @	.08
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.25 @	.26
medium white	lb.	.22 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.19 @	.22

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Parmr, solid	ton	28.00 @	45.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.31½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.08¾@	.10½
Cottonseed, crule		— @	.06½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.05 @	.06
Niger		— @	.04½
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	4.40
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	.10 @	.10½
Alcohol, denatured, No. 1 bbls.	gal.	.27 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulphide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.30 @	.38
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	— @	.36½
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refined, 125/127	lb.	.03⅝@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Aromatics—Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

CRUDE rubber prices apparently will continue weaker and weaker as production continues to exceed consumption and stocks continue to mount at all centres. The statistical situation is guiding the course of the market for the commodity and will do so until a better balance is brought about between output and absorption.

The total of crude rubber stocks in the United States and afloat to this country passed the 300,000-ton mark for the first time in history at the close of July. The actual figure reported for this date was 301,695 long tons, and this figure was undoubtedly increased as of August 31. British warehouse stocks have again turned upward and amounted to 137,184 long tons on August 29 as against 136,2[illegible] on August 1.

Gasoline consumption in July again mounted to a new high record, but automobile production has not been so encouraging as had generally expected. The resumption of activity by certain manufacturers this month may improve the outlook in this direction, however.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	13.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,174	1,028,653	14.47	36,819
July	35,182	10,553,944	13.39	2,807	759,260	12.08	32,375
Aug.	35,713	9,666,362	12.08	2,357	655,773	12.42	33,356
Sept.	35,380	8,460,812	10.68	1,514	430,772	12.70	33,866
Oct.	46,069	9,893,980	9.59	2,432	419,325	7.70	43,637
Nov.	29,401	5,700,086	8.66	1,300	271,348	9.32	28,101
Dec.	37,300	7,175,242	8.59	2,168	542,197	11.17	35,132
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.	34,005	6,564,969	8.62	1,799	357,078	8.86	32,206
Mar.	40,393	7,356,505	8.13	2,800	534,180	8.52	37,593
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,638	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,748	6.19	1,435	223,587	6.96	42,034
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1924	1925	1926	1927	1928	1929	1930	1931
Jan.	29,058	29,638	32,196	31,518	34,403	43,002	36,194	28,557
Feb.	25,736	29,761	31,136	30,137	33,702	41,594	32,302	28,797
Mar.	28,385	33,498	32,936	36,141	35,688	44,730	35,450	32,788
Apr.	27,129	34,139	32,696	35,871	32,772	47,521	39,686	33,321
May	25,845	35,322	29,364	34,592	37,333	49,233	39,386	37,817
June	22,753	35,822	28,598	33,801	37,676	43,227	34,195	37,916
July	23,396	36,053	27,577	29,219	37,407	41,526	29,508	31,937
Aug.	28,982	35,909	34,533	33,460	42,927	38,274	30,850	.....
Sept.	31,497	31,691	32,904	27,214	39,882	34,707	25,515	.....
Oct.	31,520	29,047	29,836	26,790	40,857	34,800	27,516	.....
Nov.	27,289	28,253	28,080	26,792	37,461	27,659	23,691	.....
Dec.	27,199	28,748	26,293	25,492	31,232	23,531	21,687	.....
Totals	328,769	388,481	366,149	371,027	441,340	469,804	375,980	.....

Figures on Quarterly Basis

Quarter	1924	1925	1926	1927	1928	1929	1930	1931
Jan./Mar.	87,609	95,263	94,301	99,216	103,558	128,565	101,610	89,652
Apr./June	75,674	104,099	87,109	103,242	103,500	139,292	112,229	
July/Sept.	83,813	99,493	93,793	89,210	117,573	113,746	85,261	
Oct./Dec.	92,656	85,789	83,212	80,860	117,597	84,872	72,020	
Totals	339,752	384,644	358,415	372,528	442,227	466,475	371,120	

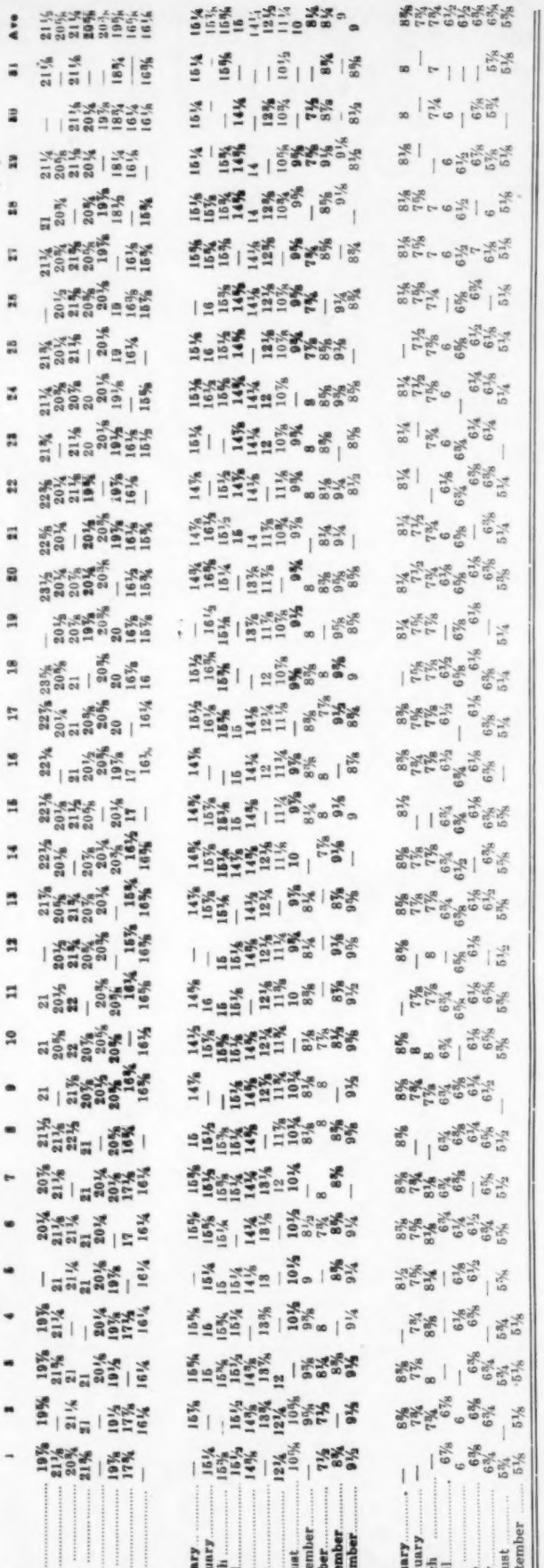
Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1930	1931	MONTHS	1930	1931
January	25,731,000	26,844,000	July	38,256,000	39,459,000
February	26,509,000	26,133,000	August	37,433,000	
March	31,029,000	31,037,000	September	37,823,000	
April	34,549,000	33,400,000	October	32,267,000	
May	36,497,000	35,716,000	November	30,984,000	
June	35,902,000	38,375,000	December	29,094,000	

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*



Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.36
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Month	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24	8.34
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85	7.70
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34	7.71
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93	6.43
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24	6.49
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45	6.35
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24	6.37
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96	5.38
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28	
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	8.20	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	9.01	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	9.05	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	11.98	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	3	3¼	—	2¼	17	3	3½	2⅝	—
2	3	3¼	—	2¼	18	3	3⅛	2⅝	—
3	3	3¼	—	2¼	19	3	—	2⅝	—
4	3	—	2⅝	2¼	20	3⅛	3	2⅝	—
5	3⅛	—	2⅝	2¼	21	—	3	2⅝	—
6	3⅛	3¼	2½	—	22	3⅛	3	2⅝	—
7	—	3¼	2½	2¼	23	3⅛	3	—	—
8	3	3¼	2½	—	24	3⅛	3	2⅝	—
9	3	3⅛	—	—	25	3⅛	3	2⅝	—
10	3	3⅛	2⅝	—	26	3¼	—	2⅝	—
11	3	3⅛	2⅝	—	27	3⅜	2⅞	2¼	—
12	3	—	2⅝	—	28	—	2⅞	2¼	—
13	3	3⅛	2⅝	—	29	3¼	2¾	2¼	—
14	—	3⅛	2½	—	30	3¼	2⅝	—	—
15	3	3	2½	—	31	—	2¾	2¼	—
16	3	3	—	—					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	Month	1929 Pence	1930 Pence	1931 Pence
Jan.	9.942	7.471	4.160	Aug.	10.505	4.880	2.385
Feb.	11.875	7.948	3.823	Sept.	10.160	4.075	
Mar.	12.135	7.595	3.822	Oct.	9.620	4.023	
Apr.	10.490	7.391	3.082	Nov.	8.442	4.440	
May	10.717	6.926	3.035	Dec.	7.958	4.516	
June	10.580	6.195	3.082	Average			
July	11.065	5.648	3.048	for Year	10.291	5.926	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.
1	8.15	6.95	11	6.85	——	21	6.65	——
2	——	6.85	12	6.75	——	22	6.85	——
3	8.10	6.80	13	7.00	——	23	——	——
4	8.15	6.70	14	6.95	——	24	7.05	——
5	8.00	——	15	7.05	——	25	7.00	——
6	7.95	——	16	——	——	26	7.20	——
7	7.95	——	17	6.85	——	27	7.05	——
8	8.05	——	18	6.70	——	28	6.85	——
9	——	——	19	6.50	——	29	7.25	——
10	6.90	——	20	6.60	——	30	——	——
						31	7.00	——

Average Monthly Price Per Pound

	1929 Cents	1930 Cents	1931 Cents		1929 Cents	1930 Cents	1931 Cents
Jan.	20.22	17.21	10.27	Aug.	18.62	12.03	7.21
Feb.	20.21	15.62	10.96	Sept.	18.83	10.85	
Mar.	20.19	15.13	10.90	Oct.	18.46	10.63	
Apr.	20.29	16.39	10.19	Nov.	17.53	10.96	
May	19.41	16.43	9.38	Dec.	17.28	10.02	
June	18.74	14.48	9.05	Average			
July	18.62	13.10	9.28	for Year	19.03	13.57	

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND			AFLOAT			ON HAND AND AFLOAT		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	76,342	131,744	209,487	93,330	61,863	56,187	169,672	193,607	265,674
Feb.	90,058	143,863	212,833	75,790	63,404	63,680	165,848	207,267	276,513
Mar.	100,536	141,843	217,804	67,065	63,646	65,133	167,601	205,489	280,937
Apr.	107,659	148,272	228,382	65,798	63,261	56,700	173,457	211,533	285,082
May	97,192	146,179	220,799	65,793	68,168	73,564	162,985	214,347	294,363
June	92,061	151,551	225,536	54,668	58,657	69,421	146,729	210,209	294,957
July	92,535	152,001	234,822	46,145	58,326	66,873	138,680	210,327	301,695
Aug.	90,769	158,604	.....	49,423	61,168	.....	140,192	219,772	.....
Sept.	84,362	169,927	.....	58,758	60,923	.....	143,120	230,851	.....
Oct.	88,483	185,470	.....	59,180	51,122	.....	147,663	236,593	.....
Nov.	92,219	189,925	.....	62,358	52,538	.....	154,577	242,463	.....
Dec.	118,609	200,998	.....	62,388	56,035	.....	180,997	257,033	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1929	1930	1931	At end of	1929	1930	1931
Jan.	25,191	60,434	81,093	July	30,080	81,048	
Feb.	25,554	64,557	82,265	Aug.	35,605	80,931	
Mar.	28,214	69,923	84,736	Sept.	42,188	83,329	
Apr.	31,368	74,676	86,982	Oct.	47,803	77,647	
May	31,290	77,312	86,726	Nov.	52,454	76,887	
June	31,025	80,260	83,071	Dec.	54,304	78,013	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1931					
April	84,339	84,421	85,704	85,922	
May	86,512	86,663	86,037	85,739	85,352
June	84,915	83,743	82,919	82,441	
July	82,170	82,079	81,766	81,104	
August	81,335	81,711	82,171	81,751	81,575

Stocks in Liverpool

1931					
April	49,502	49,733	51,221	52,043	
May	51,926	52,865	54,170	53,842	53,668
June	54,258	54,812	54,422	54,086	
July	54,522	54,444	54,697	54,335	
August	54,881	55,336	54,906	54,722	55,609

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	End of	1929	1930	1931
Jan.	29,617	39,727	49,802	July	33,859	45,459	51,203
Feb.	32,378	44,371	49,283	Aug.	30,834	48,132	
Mar.	29,437	45,657	49,590	Sept.	32,138	44,015	
Apr.	26,474	48,473	45,868	Oct.	33,770	39,930	
May	30,764	44,715	44,278	Nov.	30,963	41,674	
June	30,403	42,451	47,517	Dec.	35,548	45,963	

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Aug.	30,482	30,310	2,196	5,200	4,439
Sept.	29,863	31,000	2,343	5,334	4,554
Oct.	38,587	27,630	2,378	5,600	5,156
Nov.	40,551	24,220	2,405	5,400	4,535
Dec.	40,919	25,980	2,569	5,189	5,132
1931:					
Jan.	41,620	24,500	3,168		5,124
Feb.	43,027	24,580	3,326		5,404
Mar.	40,227	25,800	3,622	3,857	4,843
Apr.	37,103	18,500	3,659		5,137
May	37,171	17,770	3,380		4,896
June	38,748	17,500	3,219	3,518	4,894
July	40,377	29,800			4,548

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1926	24,199,524	78.8	1930	17,364,096	80.1
1931			1931		
January	681,301	67.9	July	812,642	74.0
February	1,010,774	73.9	August	924,236	80.8
March	1,425,336	81.4	September		
April	1,717,652	79.9	October		
May	1,508,349	83.7	November		
June	1,084,707	77.8	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	45,259	51,633	60,845	61,237	64,439	77,944	68,726	50,965
Shipments	45,204	50,120	59,262	59,002	64,059	74,296	69,395	53,638
Inventory[2]	5,772	7,427	8,142	10,456	10,264	13,624	11,338	9,003

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,301	4,485	3,675	6,211	4,406	3,744	12,855	11,924	8,957
Feb.	6,479	4,555	3,985	4,951	4,195	3,402	14,525	11,410	9,536
Mar.	7,049	4,863	4,663	6,289	4,717	4,122	15,329	12,513	10,014
Apr.	7,391	5,648	4,944	6,838	5,089	4,932	15,870	13,076	10,031
May	7,636	5,717	5,679	6,735	5,216	5,415	16,733	13,432	10,312
June	6,847	5,122	5,672	6,800	5,294	5,572	16,497	13,277	10,447
July	6,320	3,991		7,364	5,447		15,034	11,812	
Aug.	5,693	4,166		7,354	5,175		13,337	10,848	
Sept.	4,460	3,365		5,623	4,405		12,070	9,812	
Oct.	4,611	3,582		4,649	3,499		12,042	9,803	
Nov.	3,378	2,654		3,355	2,834		12,127	9,595	
Dec.	3,057	2,814		3,237	3,361		11,938	9,003	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	60,116	70,706	82,614	76,618	70,823	80,180	68,829	52,420
Shipments	59,072	68,106	81,004	71,591	72,896	77,127	70,592	54,938
Inventory[2]	8,425	11,052	11,313	16,200	13,692	16,117	12,807	9,999

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,109	4,607	3,623	6,789	4,857	4,062	14,424	12,704	9,439
Feb.	6,346	4,634	3,916	4,948	4,337	3,400	15,936	13,036	9,921
Mar.	7,000	4,941	4,450	6,317	4,727	3,789	16,641	13,179	10,475
Apr.	7,157	5,510	4,617	6,716	4,848	4,636	17,000	13,784	10,413
May	7,181	5,535	5,413	6,598	5,074	5,281	17,745	13,852	10,549
June	6,542	4,950	5,358	6,515	5,265	5,397	17,294	13,612	10,504
July	5,793	3,939		7,605	5,855		15,311	11,657	
Aug.	5,481	4,796		7,672	5,762		13,072	10,737	
Sept.	5,190	3,817		5,859	4,541		12,585	10,065	
Oct.	5,000	3,951		4,689	3,472		12,802	10,517	
Nov.	3,544	2,680		3,480	2,788		12,845	10,313	
Dec.	3,484	3,060		3,404	3,412		12,807	9,999	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	224,368	187,288	35,758	9,792	6,946	2,846	234,160
Sept.	216,877	175,720	41,157	7,957	5,623	2,334	224,834
Oct.	150,044	112,800	37,244	4,541	3,206	1,335	154,585
Nov.	135,752	102,957	32,795	5,407	3,527	1,880	141,159
Dec.	155,701	124,173	31,528	5,622	4,225	1,397	161,323
Total 1931	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
Jan.	171,848	138,317	33,531	6,496	4,552	1,944	178,344
Feb.	219,940	180,419	39,521	9,871	7,529	2,342	229,811
Mar.	276,405	231,244	45,161	12,993	10,483	2,510	289,398
Apr.	335,708	285,693	50,015	17,159	14,043	3,116	352,869
May	315,115	269,420	45,695	12,738	10,621	2,117	327,853
June	249,462	208,158	41,304	6,835	5,583	1,252	256,297
July	218,913	183,107	35,854	4,220	3,151	1,069	223,181
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[5]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1929:															
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	575	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,903	384	832	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,683	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	642	386	5,709	7,831	8,928	856	1,837	585	77,628
Feb.	48,947	12,960	35,987	8,055	1,245	847	642	469	6,900	7,191	11,414	944	1,787	480	75,961
Mar.	47,320	12,236	34,084	6,617	1,129	976	642	391	5,796	6,612	11,214	643	1,674	536	70,314
Apr.	43,803	14,627	29,176	4,444	856	1,026	502	366	4,802	6,326	12,724	433	1,201	630	62,486
May	49,016	13,253	35,763	5,968	975	917	502	350	6,352	6,661	12,041	753	1,383	555	72,220
June	36,607	12,120	24,487	4,577	778	1,040	201	392	4,728	4,776	9,512	425	974	551	52,441
July	41,347	12,759	28,588	3,868	792	1,087	600	327	6,022	5,891	9,770	648	810	418	58,821
Aug.	47,802	10,304	37,498	7,077	600	740	600	335	5,892	7,197	9,520	394	809	382	71,134
Sept.	48,529	8,087	40,442	7,966	343	680	600	289	5,960	6,358	7,302	527	1,093	474	72,034
Oct.	47,770	7,312	40,458	7,681	591	598	650	300	5,916	6,956	6,352	667	669	449	71,287
Nov.	41,281	7,774	33,507	6,042	864	631	600*	311	5,334	6,401	8,001	654	658	238	63,241
Dec.	42,086	9,671	32,415	6,934	1,049	976	600*	335	6,254	7,196	8,476	721	1,365	353	66,674
1931:															
Jan.	41,579	11,029	30,550	7,039	1,315	770	542	424	5,923	7,348	10,328	1,218	994	295	66,746
Feb.	41,951	9,672	32,279	6,365	1,041	945	542	409	4,869	7,206	9,001	1,018	1,271	217	65,163
Mar.	48,589	12,009	36,580	5,881	1,209	930	542	536	5,434	7,104	11,258	1,233	1,338	430	72,477
Apr.	43,353	9,977	33,376	4,333	641	788	500*	340	6,473	6,063	8,759	327	629	333	62,562*
May	44,281	10,479	33,802	4,534	622	869	500*	413	7,372	6,799	10,955	702	1,110	306*	67,984*
June	39,505	12,115	27,390	5,246	1,086	1,138	500*	337	5,856	6,697	11,381	938	621	335*	61,525*
July	43,658	11,995	31,663	4,212	1,000*	801	500*	316				841	565	335*	

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923. 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ee)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,399
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,012
1923	301,527	12,700	27,892	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,202
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,808
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,015
1929:															
July	41,114	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	69,401
Aug.	35,397	14,594	4,645	4,052	2,879	3,663	908	1,234	724	902	254	429	25	319	70,055
Sept.	32,912	17,010	3,889	4,691	1,903	3,511	1,224	1,235	853	672	253	361	91	477	68,453
Oct.	36,040	16,111	4,489	3,855	1,821	3,902	1,838	1,073	1,125	1,147	278	710	91	201	72,181
Nov.	41,097	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	361	253	595	62	313	72,564
Dec.	40,588	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,709
1930:															
Jan.	44,911	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,949
Feb.	40,792	10,293	4,482	3,697	2,250	1,886	1,385	2,705	457	1,143	188	315	200*	239	69,583
Mar.	42,216	12,346	4,354	4,289	3,776	2,663	1,083	1,153	975	678	358	322	200*	263	74,676
Apr.	43,036	13,058	5,006	4,488	2,303	2,769	2,067	929	673	1,431	158	461	200*	255	76,790
May	40,012	9,861	5,233	4,379	2,593	2,699	1,279	1,645	64	1,250	230	274	200*	282	65,628
June	37,374	9,645	4,458	3,794	2,579	2,677	1,378	1,574	67	691	343	507	200*	282	65,620
July	32,785	7,650	3,311	3,449	3,347	1,206	587	567	84	939	172	756	200*	342	55,395
Aug.	34,513	8,369	3,953	3,515	2,108	2,170	886	149	265	888	37	747	200*	450	58,250
Sept.	34,373	16,015	5,285	4,089	1,578	2,606	1,279	1,373	414	824	221	817	200*	411	69,481
Oct.	44,385	9,095	7,403	3,747	1,942	3,951	2,460	2,782	609	769	439	1,132	200*	351	79,264
Nov.	28,437	-250	13,662	3,074	2,128	4,003	2,510	2,140	464	596	364	1,180	200*	343	58,851
Dec.	35,202	12,249	7,149	3,105	1,347	4,104	2,815	544	950	814	205	647	200*	673	70,004
1931:															
Jan.	34,892	9,730	5,954	3,847	1,709	2,861	1,036	1,775	601	986	348	464	240	635	65,015
Feb.	32,575	12,226	4,510	3,374	1,927	3,264	1,393	1,022	495	785	157	475	201	366	62,770
Mar.	37,988	12,335	4,386	3,545	3,012	2,323	418	2,372	435	862	346	400	392	507	69,321
Apr.	43,036	9,440	4,346	3,054	2,070	3,478	528	1,450	457	515	333	495	208	324	69,734
May	33,343	7,212	2,880	3,231	2,748	3,755	1,023	1,034	884	1,153	86	495	180	711	58,735
June	44,190	5,636	4,002	3,504	2,112	2,988	1,459	3,279	1,112	1,058	272		207	607	
July	44,052	5,366											145		

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,781,000	232,126,000	34,499,000	74,770,000
1930	42,681,000	178,059,000	29,514,000	58,465,000
1930:				
June	3,379,000	15,795,000	2,734,000	5,318,000
July	2,940,000	15,117,000	2,663,000	4,910,000
August	3,458,000	13,735,000	1,473,000	4,552,000
September	5,046,000	14,322,000	2,193,000	4,083,000
October	5,209,000	16,460,000	3,056,000	4,186,000
November	2,822,000	11,083,000	1,426,000	3,400,000
December	1,909,000	13,101,000	3,021,000	3,138,000
1931:				
January	2,206,000	12,973,000	2,481,000	3,599,000
February	2,184,000	13,156,000	2,724,000	3,711,000
March	2,769,000	14,661,000	2,292,000	4,412,000
April	3,381,000	15,408,000	2,692,000	4,617,000
May	3,050,000	15,474,000	2,885,000	4,231,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,335	403,812	—	—
1923	1,155	542,227	700	898,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,281	545,175	728	566,964	9,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1930:								
Aug.	50	14,000	11	5,600	766	168,511	944	253,127
Sept.	100	28,000	45	39,512	486	86,664	402	127,751
Oct.	64	18,527	36	30,702	490	113,638	306	99,687
Nov.	—	—	73	61,650	389	84,219	332	65,265
Dec.	—	—	90	66,198	429	116,644	70	20,481
1931:								
Jan.	—	—	46	31,870	355	58,897	291	70,708
Feb.	—	—	17	13,801	511	114,100	369	89,470
Mar.	—	—	66	23,568	625	127,803	395	75,285
Apr.	—	—	219	69,284	676	140,309	372	73,867
May	—	—	120	44,025	205	36,086	318	82,202
June	—	—	245	79,786	681	123,616	706	129,496
July	—	—	67	20,777	331	64,493	583	104,868

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

	Consumption					Consumption			
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,884	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,758
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	146,808	155,673	39.6	24,008
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,675
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.3	25,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	11,433	10,480	41.4	21,996
Apr.	17,828	16,904	42.0	24,587	Oct.	12,349	10,724	39.3	21,145
May	17,812	17,052	42.7	23,356	Nov.	10,763	8,816	37.5	24,007
June	15,714	14,063	40.8	24,449	Dec.	10,073	8,449	39.3	24,008
1931:									
Jan.	10,340	10,723	37.6	22,429	July	11,393	11,447	35.8	17,720
Feb.	10,871	10,800	37.5	18,378	Aug.	.....	.....	.....	.....
Mar.	12,938	12,524	38.3	18,375	Sept.	.....	.....	.....	.....
Apr.	13,267	11,745	35.0	18,356	Oct.	.....	.....	.....	.....
May	13,478	13,103	34.6	18,088	Nov.	.....	.....	.....	.....
June	14,066	13,045	34.4	18,505	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.
(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

SOME PROPERTIES OF CARBON BLACK. III—Volatile Matter. By W. B. Wiegand and J. W. Snyder. Published by the Binney & Smith Company, 41 East 42nd Street, New York City. 1931. 16 pp. For free distribution.

The volatile test and its results are described in detail by the authors. This paper, which is reprinted from THE RUBBER AGE of July 10, 1931, is the third of a series on various properties of carbon black, the first two being on *Adsorption* and *Moisture*.

ORGANIZATION OF THE WORLD RUBBER MARKETS. By Dr. Franz Juda. 1931. 100 pp.

The author reviews the history of rubber marketing and gives able descriptions of the functions and status of the various types of firms participating in rubber distribution, including estate agencies, dealers, brokers and manufacturers. With regard to the price of rubber, an intriguing chart is shown, from which the logical conclusion would be that at the present time a market price of 36d would result in an annual production of 1,000,000 tons of rubber, while a price of 3d would yield but 600,000 tons; against this, a 36d level would reduce consumption to 600,000 tons and a 3d level would raise consumption to 800,000 tons; the lines of production and consumption meet at the level of 5d.

ROYLE PERFECTED TUBING MACHINE No. 1. Published by John Royle & Sons, Straight and Essex Streets, Paterson, N. J. 1931. 4 pp. For free distribution.

A short description, specifications and illustrations of this popular 2-inch tubing machine are contained in this bulletin. The machine is particularly adapted to the manufacture of small tubing, solid shapes such as windshield rubber, and covering electric wire and tire beads.

NATIONAL RUBBER MACHINERY REVIEW. Published by the National Rubber Machinery Company, Akron, O. 1931. 56 pp. For free distribution.

The vulcanizers, drums, tire building machines, tubing machines, bias cutters, molds and other equipment of this manufacturer are described and illustrated in this attractive catalog.

TAG GENERAL CATALOG, No. 1000. Published by the C. J. Tagliabue Manufacturing Company, Park and Nostrand Avenues, Brooklyn, N. Y. 1931. 104 pp. For free distribution.

This new catalog presents the complete line of TAG controllers, recorders, dials, thermometers, hydrometers, oil testing instruments and moisture meters of this company, whose experience in the manufacture of such instruments dates back to 1769. Special thermometers for rubber vulcanizers are among those described in its attractively illustrated pages.

RECORDING THERMOMETERS. Published by the Foxboro Company, Foxboro Mass. 1931. 40 pp. For free distribution.

Recording thermometers have been successfully used in connection with devulcanizers, tire vulcanizers, tube heaters, curing ovens, aging test machines and other apparatus in the rubber manufacturing industry. The use and operation of such instruments is described and illustrated in detail in this bulletin.

TRICHLORETHYLENE. Published by the Roessler & Hasslacher Chemical Company, 350 Fifth Avenue, New York City. 1931. 40 pp. For free distribution.

The use of the non-inflammable Trichlorethylene as a rubber solvent is discussed in this new booklet. Commercially known as Tri, it is described as meeting the demands of the rubber trade for a solvent non-inflammable, highly stable, uniform in composition, of low boiling point, and of low physiological effect. Its manufacturers state that it can be used alone as a general rubber solvent or mixed with flammable solvents to lower their fire hazard or increase their solvent range. As a solvent for rubber cements, Tri finds extensive application. It readily holds rubber in solution, and on exposure to air evaporates rapidly and completely.